NEW ZEALAND JOURNAL OF

Agriculture

JANUARY - 1952

Welcome News!

IMPORT CONTROLS LIFTED!

14" and 17" ATCO MOTOR MOWERS

now available in New Zealand!

This meets the demand for a quality power mower at a reasonable price, suitable for small lawn areas and means that, for the first time we are able to offer the complete ATCO range of power mowers— **14", 17", 20", 28", and 34" widths.**

More Welcome News!

The 20" ATCO has been redesigned greatly improving its performance, and a speed-up in production enables ATCO to produce this popular model at

an amazingly new low price

without sacrificing in any way that in-built quality which is the greatest asset of an ATCO motor mower.

ENGLAND'S FOREMOST MOTOR MOWER

BY APPOINTMENT

Write for the name of your nearest dealer.

NEW ZEALAND DISTRIBUTORS:

IBL **Ivory Bros. Ltd.**

P.O. BOX 1321. WELLINGTON, C.1

BRANCHES AND AGENTS THROUGHOUT NEW ZEALAND

Volume 84
Number 1
15 January
1952.
(Established 1910)

NEW ZEALAND JOURNAL OF Agriculture

Published by
Direction
of
Hon. K. J. Holyoake,
Minister of Agriculture.

This Month's Cover

Though to a great extent heavy horses have been replaced on New Zealand farms by machinery, hacks are still used widely. Interest in equestrian events at agricultural and pastoral shows is well maintained and in many districts has quickened, due to the great activity of riding schools and pony, hunt, and light horse clubs, which are doing much to maintain the numbers and quality of riding animals. The horses shown on this month's cover, which has been reproduced from a colour photograph by Atkinson and Finney, were champion and reserve champion in their class at the Wairarapa and East Coast A. and P. Association's show at Carterton last October.

TABLE OF CONTENTS

World Food Production Prospects	.. .. ..	3
The Development of Peat Soils	F. B. Thompson, I. L. Elliott, and J. Adam	4
Meteorological Records for November	.. .. ..	10
Radio Broadcasts	.. .. ..	10
Fixed Blade for Uncapping Honey Combs	I. W. Forster	11
The Mountain Pawpaw: A Giant Herbaceous Plant	P. Everett	12
Seed Production in New Zealand: Cleaning Grass and Clover Seed	P. R. Barrer	13
Care of Livestock during February	.. .. ..	26
Dairy Produce Graded for Export	.. .. ..	26
Crop and Pasture Production (Seasonal Notes)	.. .. ..	27
Brown Rot of Stone Fruit	H. A. Prew	28
Lambing Estimates for 1951	.. .. ..	29
Buckrake as Aid in Silage Making	D. F. Scott	31
Infra-red Lamps for Brooding Chicks on Poultry Farms	F. C. Bobby	32
Care and Treatment of Skins of Sheep Killed on Farm	R. G. Montgomery	33
Recent Research Work: Mineral Deficiencies	.. .. ..	38
Outdoor Tomato Trials at Lincoln	G. Priestley	39
Establishing Permanent Pasture in Bay of Plenty	A. V. Allo	41
Show Dates	.. .. ..	46
Effects of Minerals in Dairy Farm Water Supplies	S. G. Davidson	47
An Improved Air Admission Method for Use on Milking Machine Claw Pieces	W. G. Whittlestone and W. G. Batt	48
The Home Garden	C. L. Napier	49
Review of Government Herd Recording	.. .. ..	57
Household Poultry	.. .. ..	59
Domestic Beekeeping	S. Line	60
Controllable Factors which Influence Wool Returns	E. A. Clarke	61
Cooking for Seasonal Workers	Nell Macpherson	65
The Flower Garden	C. K. Ellis	69
The Place of Wool in the Fashion World	.. .. ..	74
Finishing Necklines and Collars of Garments	Edith G. McNab	75
Chou Pastry	Nell Macpherson	80

New Zealand Department of Agriculture

HEAD OFFICE:
Dominion Farmers' Institute Building, Featherston Street, Wellington.

DIRECTOR-GENERAL:
E. J. Fawcett

ASSISTANT DIRECTOR-GENERAL:
R. B. Tennent

DIVISIONAL DIRECTORS:

Animal Research	J. F. Filmer
Dairy	H. A. Foy
Extension	P. W. Smallfield
Horticulture	A. M. W. Greig
Livestock	J. E. McIlwaine

Editor: G. J. Neale

SUBSCRIPTION RATES

The "Journal" is issued monthly. The subscription within New Zealand is 10s. a year; the overseas subscription is 13s. The "Journal" may be ordered from any bookseller or newsagent, or direct from any office of the Department of Agriculture. Individual copies are available from Publications Section, P.O. Box 2298, Wellington, at 1s. a copy, post free.

Subscription inquiries (preferably accompanied by the address cut from a recent "Journal" envelope or wrapper) should be sent to the nearest office of the Department of Agriculture.

COPYRIGHT PROVISIONS

Articles in "The Journal of Agriculture" are copyright, but may be reprinted, **provided both the "Journal" and author are acknowledged.**

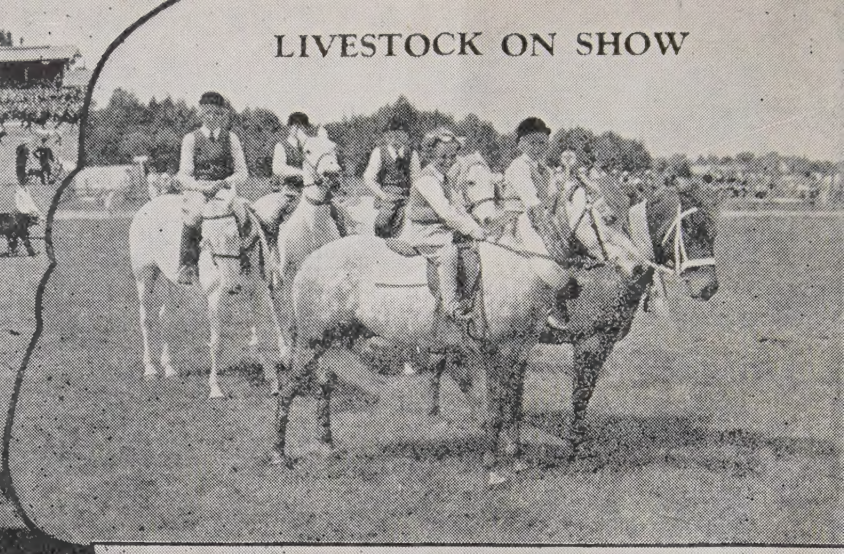
The Minister of Agriculture does not accept responsibility for any of the private and trade advertisements included in this publication.

All correspondence relating to the "Journal" should be addressed to the Editor, "The New Zealand Journal of Agriculture", P.O. Box 2298, Wellington.

REGISTERED AT THE G.P.O., WELLINGTON, AS A MAGAZINE.

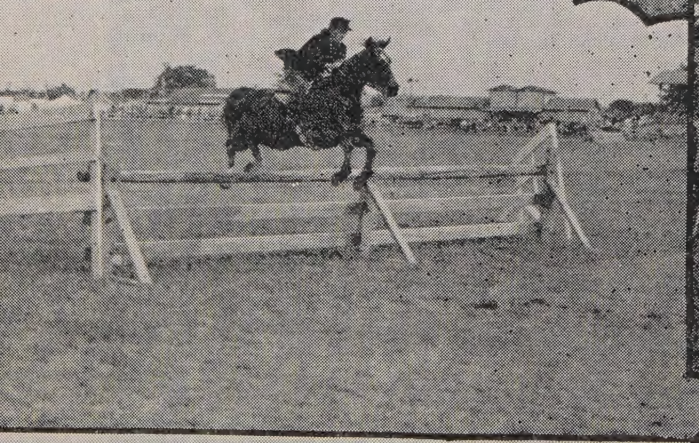
25 MAR 1952

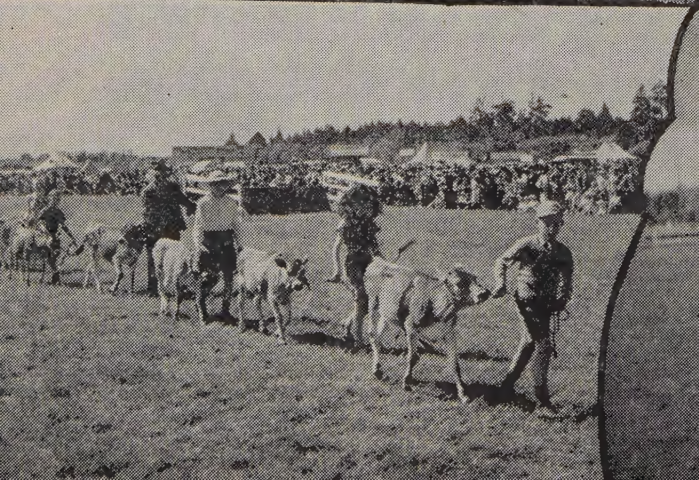
LIVESTOCK ON SHOW



New Zealand's wealth has been built largely on its progressive livestock industry, and agricultural shows provide the people of New Zealand, farmer and townsman alike, with an opportunity of seeing the fine quality of stock on which the industry is based. The keener observer, too, will be able to watch the progress which has been made in selection and breeding and by farm management.

[Photographs by National Publicity Studios.





World Food Production Prospects

I HAVE recently received two documents published by the Food and Agriculture Organization which are of particular interest to all who are concerned with world food problems.

One of these documents is called the Present and Prospective Development of Agriculture in Principal Regions and is based on questionnaires issued to member Governments on likely production prospects for 1952-53 and other data; the other is the report of the Twelfth Session of the Council of FAO, and contains an appendix summarising the current situation and prospects of food and agriculture.

Both documents make extremely interesting reading, although neither is particularly encouraging; in fact the conclusions are perturbing. The first document analyses prospects by regions and combines the results into a world total in the form of carefully calculated indices.

INDICES OF RECENT AND PROJECTED TOTAL WORLD PRODUCTION

(excluding U.S.S.R.) 1934–38 = 100

Period	*Food Crops*	*Animal Foods*	*Raw Materials*	*All Production*
1948–50 ..	107	107	108	107
1952–53 ..	116	120	124	119

It will be seen that total agricultural production has increased by 7 per cent. over the pre-war average, but when it is realised that world population has increased by 12 per cent. in the same period it is clear that food and raw materials available per head of population have declined. On this basis 1948-50 supplies were only 95 per cent. of pre-war, but the report emphasises that even this presents too rosy a picture in that a disproportionate part of the increased production has taken place in regions which were already producing food surpluses, especially North America, Australia, and New Zealand, and the increases consist principally of animal foods. In the remaining areas of the world containing 91 per cent. of the population agricultural production over the past 3 years has enabled supplies per head equal to only 90 per cent. of the pre-war level to be maintained.

Objectives for 1952-53 are a level of production 19 per cent. above pre-war, but even if this is attained, it will not result in any marked improvement for the mass of the world's people, as population is expected to increase by 16 per cent. over pre-war by mid-1953. Furthermore, the rate of increase will be very uneven as between regions, and a still further complicating factor is the greater stress which is being placed on raw materials, which means principally fibres.

We in New Zealand have cause for alarm at the effect of high wool prices on the production of staple foodstuffs such as wheat and potatoes, and Australia is encountering the same problem to a greater extent.

The problem of maldistribution of food supplies cannot be more clearly illustrated than by a table quoted in the report showing that pre-war the Far East with 55 per cent. of the world's population (excluding the U.S.S.R.) produced 35 per cent. of total agricultural production. At present the percentage of the population remains nearly the same, but the proportion of production has declined to 32 per cent. and by 1952-53 it will be 31 per cent. The United States and Canada, on the other hand, with 7 per cent. of the world's population produced 17 per cent. of agricultural production pre-war and 23 per cent. in recent years. The report concludes: "It is evident that the problem of attaining a rhythm of agricultural expansion sufficient not only to take care of population increase but also to raise nutritional standards has not yet been solved. Its solution will require much greater national efforts and a higher degree of international co-operation than has so far been achieved."

The second report, containing the summary of the current situation and prospects for food and agriculture, deals more with the immediate situation and the impact of intensive re-armament programmes on agricultural prices.

The effects have been two-fold. The demand for raw materials of agricultural origin and of strategic significance increased almost without precedent, as New Zealanders will know with regard to wool prices. A similar demand for rubber is affecting rice production in those countries producing both commodities. Paddy fields tend to be neglected for highly paid work on the rubber plantations.

Competitive demands for raw materials are already affecting agricultural production. New Zealand's greatest difficulty in this respect is our inability to obtain sufficient sulphur for superphosphate manufacture.

After stating that future prospects are difficult to determine in view of the current uncertainty in the economic, political, and military spheres, the report says: "The diversion of resources to defence efforts . . . may not affect food output immediately during the coming year (1951-52), but if manpower, raw materials, and industrial products are diverted to industrial expansion and re-armament to such an extent as to reduce resources for agricultural production, the present upward trend in agricultural output may slow down or reverse itself."

My main conclusion from a study of these two reports is that New Zealand farmers cannot do better than follow the traditional pattern of their production with concentration on livestock products for export, but with due attention to local needs of products which either cannot be satisfactorily imported or can be imported only at high cost.

I fully appreciate that climatic factors have this year been against the growers of cereals and potatoes, but I feel sure that next season will see a greatly increased acreage planted in these commodities so essential to our food supplies.

K. J. HOLYOAKE, Minister of Agriculture.

The Development of Peat Soils

THE results of initial research work at the Rukuhia Soil Research Station, Hamilton, on the development of peat land were described in the February 1950 issue of the "Journal". This article by F. B. Thompson, Agricultural Chemist, I. L. Elliott, Assistant Superintendent, and J. Adam, Assistant Research Officer, all of Rukuhia Soil Research Station, Department of Agriculture, Hamilton, discusses the results of more recent experimental work on peat soils, particularly that dealing with mole draining of peat swamps, pasture establishment on raw peat, and the topdressing of established pastures.

DRAINING is the first essential in the development of peat swamps. The previous article on peat development in the "Journal" mentioned that, because undecomposed peat is relatively impervious to water, it is difficult to obtain good drainage without closely spaced subsidiary drains.

In the larger swamps in the Waikato deepening of drains round a paddock has not given effective drainage throughout the paddock. It tends to increase the subsidence of the peat near the drains, with the formation of a hump in the central, undrained portion of the paddock. Apart from the fact that only the edges of the paddocks become drained, the resulting unevenness of the surface makes it practically impossible to operate a system of water control by sub-irrigation.

Trials with Mole Drains

In those areas sufficiently free from timber mole drains may provide a means of installing adequate internal drains at a reasonable cost. In the initial trials with mole drains the undecomposed roots of the vegetation which formed the peat presented some difficulty. These roots, particularly those of *Gleichenia cireinata*, the umbrella fern, are not easily cut in soft peat, and when moles are pulled with a normal type of plough the roots collect in the angle between the blade and the torpedo. When the blade was thus blocked with roots light timber was neither cut nor pushed clear, but was carried on the front of the blade and tended to lift the plough out of the ground. Use of a curved blade without a torpedo and with the plug above and behind the bottom of the blade as shown in the illustration on page 7 enabled any roots not cut to be pushed below the plug. The blade thus remained clear of roots and was able to cut through timber up to 2 or 3in. in diameter, provided the plough was adequately weighted.

Although the curved blade was an improvement, it was not entirely satisfactory. For mole draining peat a different type of plough is required. The plough should be sufficiently heavy to cut through or lift out light timber and mounted so that the beam is high enough above the ground to be clear of roots and timber carried by the blade. A more suitable type is shown in the illustration on page 7. It is a ditcher and pan breaker which the owner, Mr. J. D. Wallace, of Cambridge, modified by extending the wheels and replacing the mould boards with a blade and plug. This mole plough, which weighs more than 1½ tons, was used with success on the experimental area on the Moanatuatua swamp, where the standard type of mole plough was useless because of the very soft peat and the rushes and short scrub. Further experience with Mr. Wallace's plough will probably suggest modifications to improve its efficiency.

In districts where the peat is decomposed and contains an appreciable admixture of alluvial sand or silt it may be sufficiently permeable to be drained effectively by normal open drainage systems without the need for putting in moles or other subsidiary drains.

Pasture Establishment on Raw Peat

The principal factor limiting the establishment and maintenance of good pasture on raw peat is the deficiency of available nitrogen in the peat. Attention must therefore be focused on the establishment and maintenance of vigorous clover growth in the sward so that the clovers will be able to obtain sufficient nitrogen from the air to make good this deficiency. Establishment of clovers on raw peat is primarily limited by the acid conditions or the low pH. Therefore the first step after draining is to make the peat less acid or to raise the pH. Liming is the obvious method of doing this, but the pH may be raised to a limited extent through the destruction of the organic acids in the peat by burning or weathering. Peat ash does not contain much calcium, and analyses of peats which have been burnt or weathered but not limed usually show that the peat is very low in available calcium. Even if the pH were satisfactory, these peats may require lime to supply calcium, which is a necessary plant food.

The article in the February 1950 issue of the "Journal" described how clover seedlings germinated in acid peat of pH 4, but did not survive past the seedling stage. Therefore in pasture establishment on acid peat the pH has to be raised when the pasture is sown, and it would not be satisfactory to adopt a long-term policy of raising the pH by weathering or by applying a little lime every year. If the clover seedlings die because the initial conditions are not suitable, the better grasses such as ryegrass are likely to disappear from the sward because there is insufficient available nitrogen to meet their requirements. Under these conditions, after clover has disappeared from the sward, there may be little response to subsequent liming or topdressing with phosphate or potash because the lack of available nitrogen is the principal limiting factor.

Over a period of years the pH may rise with weathering, provided the area is drained, and some clovers may come in, particularly if hay is fed out over the area. This raises the question of method in developing peat land. The choice is between long-term development involving minimum expenditure and little return on the one hand, or, on the other, making conditions suitable for the establishment of a good pasture in the first place and obtaining some return to pay for the cost of those items, such as fencing and water supply, which are common to both methods of development.

If the peat is very acid, liming is essential for good pasture establishment.

HEADING PHOTOGRAPH: Portion of the Rukuhia peat experimental area, 4 miles south of Hamilton. This pasture is on unconsolidated raw peat 30ft. deep and which is typical of the adjacent 10,000 acres of undeveloped peat that extend for miles in the middle distance. Mt. Pirongia (3156ft.), in the background, is 15 miles away.

Method of Application of Lime

Experiments have shown that lime is generally slow in moving down through peat. Three years after a pasture had been topdressed with 4 tons of lime per acre very little lime below the surface 2in. could be detected by analysis. Thus heavy or repeated dressings of lime may not be any more beneficial than an initial application of, say, 1 or 2 tons per acre. In an experiment on acid peat the application to the pasture of 2 tons of lime per acre gave results practically no better than those obtained from 1 ton of lime. The application of 1 ton of lime per acre was sufficient to raise the pH of the top inch of peat, and the heavier application was no better because the lime did not get down to the deeper layers where it was particularly required.

Because lime is so slow in moving down, it is considered desirable to work it into the peat before the pasture is sown; the roots of the pasture plants may then go down as far as possible instead of being confined to the surface inch or so, which frequently happens with pastures on raw peat. A deep rooting system is perhaps even more desirable on peat than on normal mineral soils, because the weight of dry material in peat is very much less than that in a similar volume of mineral soil. Therefore to enable them to have access to adequate quantities of available nutrients and water plants on peat require a greater volume in which to root.

Effect of Peat on Plant Roots

The effect of peat on the rooting systems of plants was strikingly demonstrated by an examination last February of lucerne roots in peat the surface layers of which were well decomposed. The area had been limed and topdressed and the analyses given in Table 1 show that the peat near the surface had a satisfactory pH and was well supplied with nutrients. Below 6in. the peat was very acid and deficient in the major plant foods. It is not surprising that under these conditions the lucerne plant had changed its normal rooting habit and that the taproot went down about 5in. only and then grew horizontally, as shown on the right of the illustration on page 9.

Although water could be squeezed out of the raw peat 9in. below the surface, the top 6in. were extremely dry, because all the available water had been removed by the lucerne roots and by evaporation. The unfavourable conditions in the deeper layers prevented the roots going down to the moist peat, and the crop had practically stopped growing through lack of water. However, the farmer kept it growing vigorously by spray irrigation and obtained two more cuts before winter, whereas in the previous year, without irrigation, there was very little growth after December.

TABLE 1—ANALYSIS OF PEAT FROM LUCERNE PADDOCK

Depth of sample in.	pH	Calcium	Phosphate	Potash
0 to 3	6.3	High	Very high	High
3 to 6	5.4	Medium	Medium	Very low
6 to 9	4.4	Very low	Very low	Very low
9 to 12	4.1	Very low	Very low	Very low

Although lime is slow in working down through peat, recent experiments have shown that there is a slight loss in the water draining through 18in. of peat in lysimeters. Pasture was sown in the lysimeters after lime, at the rate of 3 tons per acre, had been worked into the top 5in. of peat. Results so far available show that for the first 7 months calcium salts equivalent to 30lb. per acre of limestone have been recovered in the drainage. Even if the downward movement of lime were continued at this rate for several years, it would be negligible relative to the 1 or 2 tons per acre required to ameliorate raw peat to a depth of 3 or 4in.

The successful establishment of a good ryegrass-white clover pasture on relatively undrained, acid peat 30ft. deep on the experimental area in the Rukuhia swamp is partly attributed to the incorporation of lime into the peat before sowing. This pasture, on an area which was previously practically waste land, is shown in the coloured reproduction of a photograph on the cover of the August 1951 issue of the "Journal". Portions of the area before and after pasture establishment are shown in the illustrations below. After the manuka had been cut and burnt the peat was topdressed with 2 tons of lime per acre and then ploughed about 9in. deep. A further 2 tons of lime per acre were applied to the ploughed surface and disced in. Two hundredweight of serpentine superphosphate and 1cwt. of muriate of potash were topdressed on the surface and the area was sown in April 1950 with a mixture containing perennial ryegrass, short-rotation ryegrass, cocksfoot, Yorkshire fog, paspalum, white clover, red clover, and *Lotus major*. Copper sulphate was also applied.

The effect of the total application of 4 tons of lime per acre on this very acid peat is shown by the following figures:—

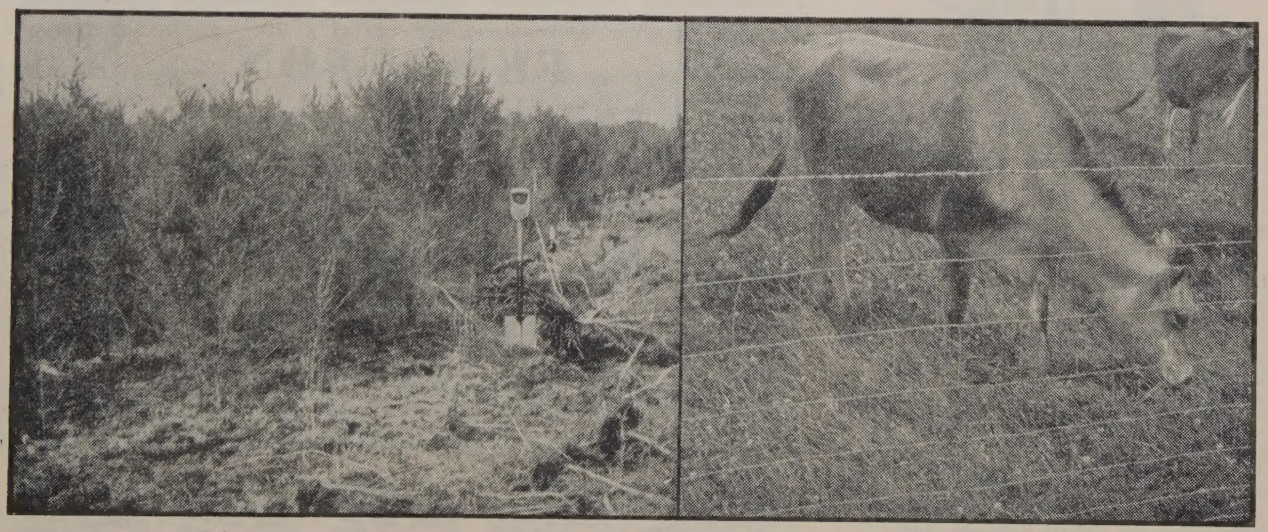
Depth of sample in.	pH of peat Unlimed	Limed
0 to 2	4.3	5.4
2 to 4	3.9	4.7
4 to 6	3.8	4.4

The application of 4 tons is not a general recommendation for use in peat development, because in practice the peat cultivated by the average farmer is less acid than that on the experimental area. Inquiries regarding the lime required on any particular area should be referred to the local Instructor in Agriculture.

Bare Patches in New Pasture

Bare patches frequently develop in new pasture sown on peat. In time these patches become covered with sorrel, moss, or weeds, and may remain practically worthless for pasture production until the paddock is resown.

The nature of the bare patches which developed were studied in the pasture sown on acid peat in the experimental area in the Rukuhia swamp in April 1950. When the new grass was up there appeared to be bare patches in the paddock, but this deceptive appearance was due to the smaller



A portion of the Rukuhia peat experimental area in 1949 (left) and 1951 (right).

The New Scientific rat killer that

KILLS AT A TOUCH

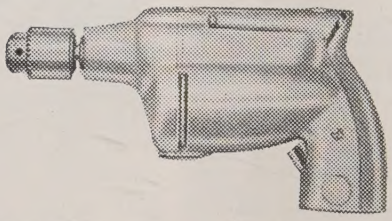
Sprinkle RANTU around rat holes and runways . . . the rat picks up the dust, licks his feet and dies within 12 or 48 hours, usually outdoors. 100% effective. This special preparation of Alpha Naphthyl Thiourea is now available at all stores in 3oz tins or larger sizes.

Distributors: T. A. MACALISTER LTD., 12 Albert St., Auckland.

DESOUTTER

PORTABLE POWER TOOLS

ELECTRIC



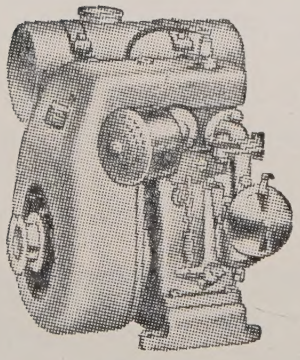
PNEUMATIC

N.Z. Agents:

de PELICHET McLEOD & CO. LTD., HASTINGS

For AGRICULTURE

For INDUSTRY



VILLIERS LIGHT-WEIGHT ENGINES

VILLIERS WILL POWER:

Generators, Water Pumps, Chain Saws, Vacuum Pumps, Cultivators, Shearing Machines, Rock Drills, Saw Benches, Concrete Mixers, Compressors, Spraying Equipment, Lawnmowers, Inboard Engines.

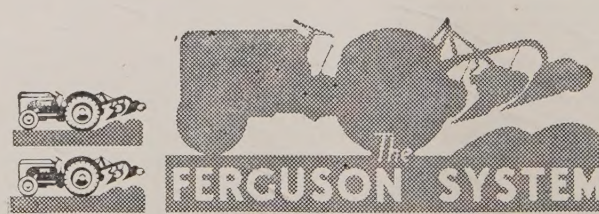
Obtainable in 1h.p., 2h.p., 2½h.p. Models

Villiers

N.Z. Factory Representatives:

F. W. CAVE LIMITED,

P.O. Box 1685, Auckland.



FERGUSON

The ONLY Tractor with these

5 exclusive advantages!

- Traction without built-in weight.
- Penetration of implement without weight.
- Finger-tip hydraulic depth control.
- Front end kept down.
- Automatic protection of tractor and implement against hidden obstructions.

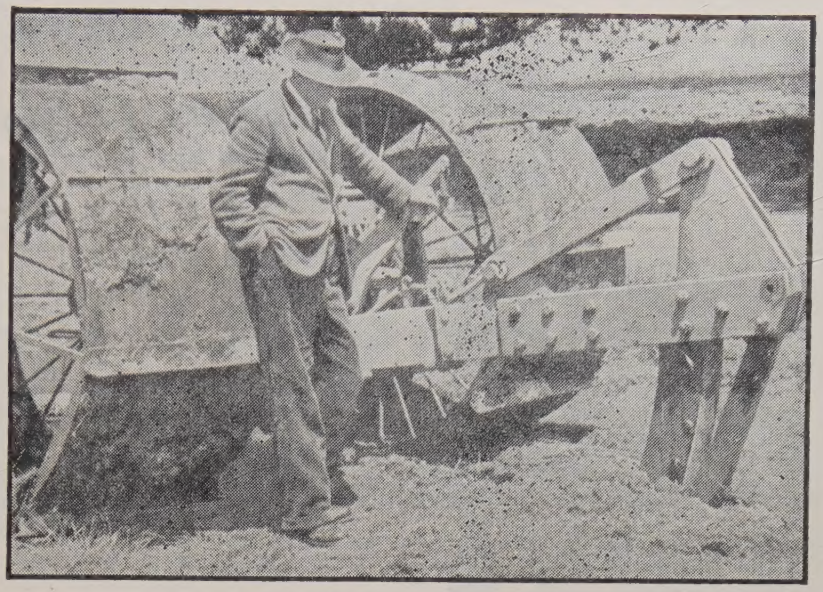
C. B. Norwood Ltd., Box 1292, Wellington.

size of seedlings on the drier hummocks where germination was slower. Six weeks after sowing there was little difference between the hummocks and the hollows, and counts of 250 clovers and 500 grasses per square yard were obtained. Subsequent counts showed a decrease in the numbers, particularly in the clovers. At the last count (August 1950) there were about 100 clovers and 350 grasses per square yard. As the pasture was not sown until 24 April, some loss of clovers through frost lift was to be expected.

By July bare patches started to develop in the paddock and became progressively more noticeable during August and September with the spring growth. Analyses showed that these bare areas were more acid and more deficient in lime than adjacent areas carrying good pasture. The bare areas were generally in strips across the paddock and were attributed to portions being missed when the lime was applied after ploughing. The surface at this stage was too soft to hold the narrow wheels of the topdresser, so the lime was put on by a rotary distributor attached to a trailer on aeroplane wheels. Apparently some runs with the distributor were too far apart, leaving strips with little or no lime and where the peat was too acid for the survival of the seedlings which had germinated.

Strips of Good Clover Growth

As the pasture improved in November and December the paddock became marked by another series of more frequent strips across the paddock. These were strips of good clover growth several feet wide and about 20ft. apart that were attributed to the heavy application of lime which fell immediately behind the rotary distributor. The lanes in between, corresponding to the edges of adjacent runs with the distributor, had sufficient lime for the establishment of Yorkshire fog, ryegrass, and some clover, but not enough for good clover growth. The lime thrown to the sides of each run would include the coarser particles which according to the figures in Table 2 are much slower than fine material in reacting with acid peat. Similar weights of the various fractions of lime were mixed with peat and the pH was determined on the same day, after 5 weeks, and again after 10 weeks. After being mixed with the lime the peat was moistened with water and kept in stoppered flasks to prevent its drying out.



A ditcher modified for mole draining peat. The weight is distributed by the extensions to the wheels so that the 1½-ton implement can be used on very soft peat. When it is in working position as shown, with the beam well above the ground, this mole plough can be used on unimproved peat in rushes and short scrub.

TABLE 2—EFFECT OF FINENESS OF GRINDING OF LIME ON pH OF PEAT

Fineness of grinding of lime	pH of peat 1 day	5 weeks	10 weeks
No lime	3.7	3.7	3.7
Retained on 8 mesh ..	4.0	3.7	4.3
Passed 8 mesh, retained on 16 mesh	4.0	4.1	4.5
Passed 16 mesh, retained on 30 mesh	3.9	4.2	4.8
Passed 30 mesh, retained on 60 mesh	4.0	4.7	5.3
Passed 60 mesh, retained on 120 mesh	4.0	5.1	5.2
Passed 120 mesh	5.5	5.3	5.0

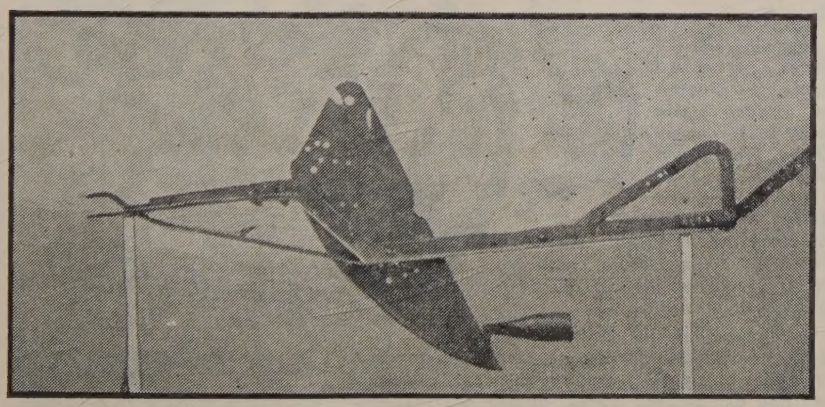
The results set out in Table 2 show that coarse lime has very little effect on the peat, even after 10 weeks, whereas the fine material reacts immediately. This suggests that coarse lime, even if applied in sufficient quantity, may be so slow in reacting that clover seedlings may germinate and then die before the pH is raised sufficiently for their survival. The minimum pH figure for good pasture establishment has not yet been determined. Peat at pH 4 is too acid, and pH 5 is satisfactory, but higher figures would be better. The minimum figure is probably about pH 4.7.

If a distributor which throws the coarse particles to the outside is used, the runs should be close enough to give sufficient overlap to ensure that the whole area has a dressing of at least some of the finer material.

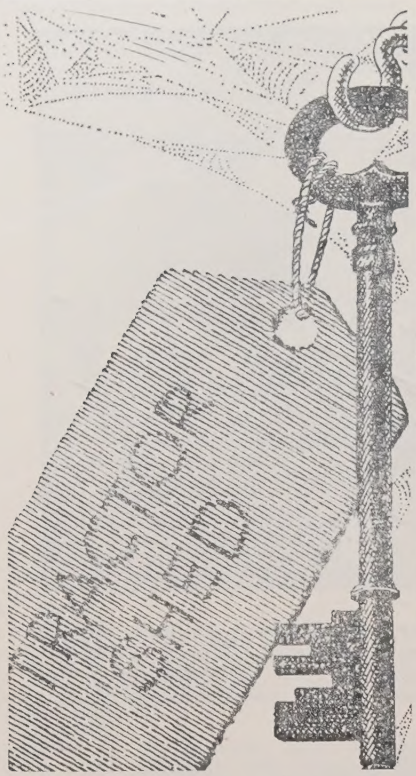
Importance of Even Distribution

As most unimproved peat is deficient in plant nutrients, evenness of distribution of fertilisers is equally important. In one portion of the new pasture there was a poor strip which according to appearance and analyses was obviously suffering from phosphate deficiency. Apparently this strip had been missed when the serpentine superphosphate was put on by hand before the pasture was sown.

To enable the topdresser to be used on the cultivated peat so that the lime and fertilisers could be distributed more evenly in subsequent experiments wooden cleats were attached by U bolts to the rims of the wheels of the topdresser. Ten cleats each 14in. long of 4in. x 1in. hardwood were used on each wheel. The topdresser, fitted with these attachments, as shown in the illustration on page 9, was able to travel over soft peat in winter without difficulty. With only 10 cleats on each wheel the topdresser bumped somewhat when in motion.



An adapted mole plough used in Rukuhia trials. Use of a curved blade without a torpedo enabled any roots not cut to be pushed below the plug. The blade thus remained clear of roots and was able to cut through or push aside light timber.



AN IDLE DIESEL IS CAPITAL LOCKED UP

The one sure way to keep your diesel running perfectly, month after month, is to keep the C.A.V. Fuel Injection Equipment clean. Study your handbook; treat the filters as directed, and be scrupulously clean with the fuel too.
It is wise economy to have a periodical checkover by a C.A.V. factory-trained expert. Your nearest C.A.V. Service Agent is listed below.

C.A.V.

Fuel Injection Equipment keeps on with the job

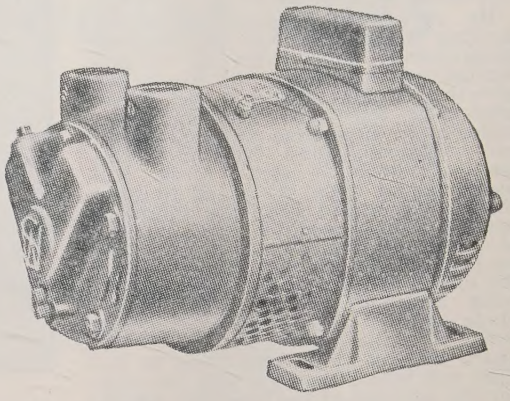
Joseph Lucas (N.Z.) Ltd.
75-77 Beach Rd., **AUCKLAND.**
Unity Buildings, **HAMILTON.**
Grey Street, **TAURANGA.**
Civic Buildings, **WHAKATANE.**
Whangarei Engineering Co., **WHANGAREI.**
L. M. Silver & Co., Ltd.,
Jervois Quay, **WELLINGTON.**
King Street, **PALMERSTON NTH.**
263 Victoria Avenue, **WANGANUI.**
Wooff & Salvesen Ltd.,
17-19 Lichfield St., **CHRISTCHURCH.**
218 Crawford Street, **DUNEDIN.**
Giles & Duncan, 52 Theodocia St., **TIMARU.**
Ross Mitchell Ltd., Don St., **INVERCARGILL.**

THE WORTHINGTON SIMPSON

MOTOR DRIVEN SELF-PRIMING

DOMESTIC PUMP

THE IDEAL PUMP
for:
Farms,
Market-Gardens,
Estates,
General Domestic
and similar services.



Distributors:

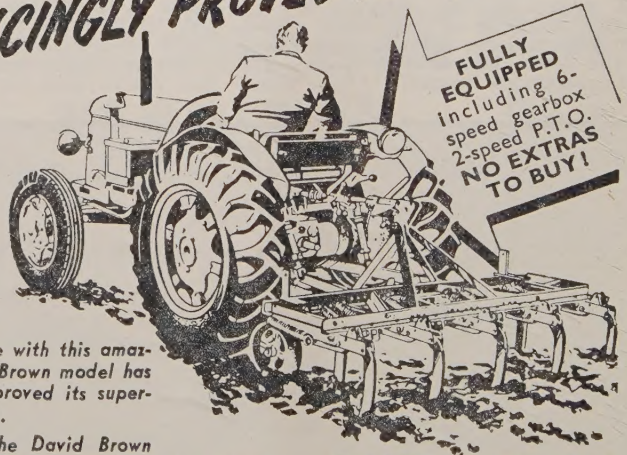
A. & T. BURT LTD.

AUCKLAND
DUNEDIN
WELLINGTON
WANGANUI
INVERCARGILL
CHRISTCHURCH
TIMARU

Enquire from your local WORTHINGTON SIMPSON Dealer.

After operating a DAVID BROWN for three years this farmer says:

"Amazing 6-speed DAVID BROWN has CONVINCINGLY PROVED its superiority"



Dear Sirs,

As you know, I have operated many other tractors of various makes prior to having my David Brown, and although some of them performed quite well, my practical experience with this amazing 6 Speed David Brown model has most convincingly proved its superiority over them all.

Whilst pulling the David Brown 3 furrow plough in heavy ground, the fuel consumption did not exceed one gallon per hour, and while carrying out discing, sowing, ridging and topdressing, etc., its range of six gears is a feature which must make any owner wonder why he did not purchase one many seasons before.

M. B., Blenheim.

DAVID BROWN

WORLD'S FINEST TRACTOR

N.Z. Distributors:
TODD BROS. LTD., Wellington.
DEALERS EVERYWHERE.

thus giving an uneven flow of fertiliser. It would be better to have either extensions to the wheels or more cleats closer together.

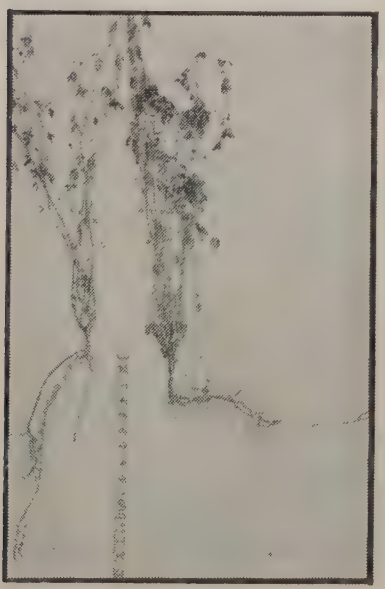
By using similar extensions, bolted on to the plates of the tracks of tracklaying tractors, farmers and contractors have been able to work on soft peat, on which the machines would otherwise become bogged. A 5½-ton tractor was able to work on very soft peat when it was fitted with extensions 31in. long. Tractors fitted with these extensions cannot be manoeuvred quite as easily and more care has to be taken in turning, particularly on hard ground or in timbered peat.

When pasture is sown on acid peat both lime and fertilisers must be distributed evenly. The distribution of the lime should be even in both quantity and particle size.

Topdressing of Established Pasture

Information on the quantities of phosphate and potash required to obtain best results on good established pasture is being obtained from trials conducted by Instructors in Agriculture in various parts of New Zealand in addition to the experiments at the Soil Research Station. Different results are obtained according to the nature and fertility of the peat. It is simply a question of maintaining in the peat a balanced supply of the nutrients necessary for plant growth. Heavy applications of one fertiliser are of little value if the deficiency of another fertiliser is the main factor limiting plant growth.

Generally peat is deficient in available potash, but if the available phosphate is also low, as in areas recently brought in from the raw state, or in a decomposed peat with high phosphate fixation, little benefit is obtained from heavy applications of muriate of potash unless heavy rates (more than 4cwt. per acre) of phosphate are also applied. The results from the experimental area sown in April 1950 illustrate this point.



Lucerne from clay loam (left) and peat (right). The peat below 6in. was so acid and deficient in nutrients that the taproot did not enter it.

When this area was topdressed in September 1950 it was found that 2cwt. per acre of potash was little better than 1cwt. when each was applied with 2cwt. of serpentine superphosphate. However, when various quantities of phosphate each mixed with 2cwt. of potash were applied 4cwt. of phosphate gave excellent results, 2cwt. of phosphate was intermediate, and the plots with no phosphate were poor. These results considered in conjunction with analyses of the peat indicate that the low available phosphate limited the response to the potash. Two hundredweight per acre of serpentine superphosphate did not raise the phosphate status sufficiently to enable the heavy potash topdressing to be of much benefit.

Results of Potash Topdressing

In other areas where the soil phosphate had been built up by consistent topdressing and had not been rendered unavailable by fixation good results were obtained from 2cwt. or more per acre of potash when applied with moderate quantities of phosphate. The results obtained by the Instructor in Agriculture, Matamata, from trials on Hungahunga peaty loam near Te Aroha, are an example.

An application of 1cwt. per acre of muriate of potash gave 100 per cent. increase in yield of pasture, compared with no potash, and 2½cwt. of potash gave 170 per cent. increase. This was on an area which had received 12cwt. per acre of phosphate fertiliser during the previous 3 years and where the available phosphate in the peat was high. Thus big responses were obtained from heavy rates of potash when applied with only 1½cwt. of superphosphate, and heavier applications of phosphate did not increase the yields appreciably. However, this is not typical and most of the other peat experiments have shown that increasing the phosphate to 6cwt. per acre, and in some instances to 9cwt., is beneficial.

Peat is not always low in available potash and responsive to topdressing with muriate of potash. In an experiment in Southland in which no response to potash was obtained analyses showed that the peat was high in available potash.

The response to any given mixture of phosphate and potash and the proportions of these which will give the best results are governed by the relative quantities of the available nutrients in the peat. This may appear an obvious general statement. However, it applies more to peat than to mineral soils, because the latter have a big reserve of minerals which may become slowly available to plants, whereas peat has much less mineral matter. The difference in content of mineral matter or ash is clearly shown in Table 3. Thus the supply of available nutrients in peat depends more on the topdressing than that in mineral soils. Consequently pasture on peat is liable to deteriorate more rapidly than that on mineral soils if topdressing is discontinued or if the correct fertilisers are not applied.

The loss of nutrients in the drainage water is determined by analyses of the drainage from these lysimeters, filled with peat.

TABLE 3—MINERAL MATTER IN PEAT AND LOAM SOIL

Description	Weight of dry peat or soil per acre 0 to 3in. lb.	Mineral matter (ash) per cent.	Weight of mineral matter (ash) per acre 0 to 3in. lb.
Very raw peat	50,000	5	2,500
Partly decomposed peat .	200,000	30	60,000
Peaty loam ..	350,000	60	210,000
Clay loam ..	500,000	90	450,000

Wooden cleats attached by U bolts to the rims of the wheels enabled the topdresser to be used on soft peat.

Recommended Topdressing Mixtures

It is difficult to say what is the best fertiliser mixture for any peat area without a knowledge of the quantities of available nutrients already in the peat, and analyses of the peat are therefore of great assistance. Requests for sampling for analysis should be referred to the local Instructor in Agriculture. Owing to present staff limitations only a limited number of peat farmers may be able to receive advice before the next topdressing, and for the guidance of the others some recommendations are desirable, although it is very difficult to make general statements covering all types of peat and all districts. It is suggested that a mixture of 3cwt. of phosphatic fertiliser and 1cwt. of muriate of potash per acre be regarded as a standard topdressing mixture for peat. This should be modified according to the particular conditions as follows:—

If the peat has had less than 6cwt. of phosphatic fertiliser in the 2 previous years, more phosphate than the 3cwt. in the standard mixture should be applied.

If the peat has had more than 6cwt. of phosphatic fertiliser in the 2 previous years, the potash in the standard mixture could be increased.

The potash in the standard mixture could be omitted if potash is known to be of no benefit in the district concerned or if the clovers in the pasture are growing vigorously without potash topdressing.

The position may arise where clover growth has been good in the past without potash being used, but deterioration of the pasture, though so gradual that it is not obvious, is suspected. Naturally it is not desirable to wait until deterioration of the pasture has reached an advanced state, and if the onset of potash deficiency is suspected, the advice of the Instructor should be sought or the farmer could conduct some trials himself. One pound of muriate of potash (or any other fertiliser) put on a strip 1 chain long and 1yd. wide is approximately equal to an application of 2cwt. per acre.

These recommendations are tentative only and may have to be revised as more information is available regarding the topdressing of peat, and they may require modification to suit particular circumstances.

In the various experiments there has been little difference in the results obtained from superphosphate and serpentine superphosphate, and the term phosphatic fertiliser has been used in this article to include both these fertilisers.

Results are not yet available from the recent "super. compound" on peat, but in the meantime it may be assumed that the quantities given for phosphatic fertilisers apply also to "super. compound".

Generally it is considered better to topdress peat in spring than in autumn. When the peat dries out severely in autumn so much rain is required to re-wet it adequately that by the time it is sufficiently wet for good pasture growth the weather is so cold that temperature is a limiting factor. Under these conditions autumn topdressing may not have much effect on pasture growth and there is a danger that the phosphate may become fixed and the potash leached down below the root zone before the temperature and moisture conditions in the spring are suitable to enable the pasture to utilise the added fertiliser.

Other Experiments

In addition to the trials with lime, phosphate, and potash, experiments have been conducted at the Soil Research Station with nitrogenous fertilisers. Early-spring applications of sulphate of ammonia gave outstanding responses on new pasture on peat, but there was a subsequent depression of clover growth except on a portion of the nitrogen-treated area which was spray irrigated. On peat land where nitrogen deficiency is so acute nitrogenous fertilisers may have an important role in stimulating the growth of grasses during the establishment stages before the clovers are able to supply sufficient nitrogen. Further experiments along these lines will be carried out on new grass next winter.

Nearly every year on most soils of New Zealand pasture growth during a portion of summer and autumn is limited by lack of water, and this effect is usually more prolonged on peat land because of the difficulty in re-wetting the dry peat. In an experiment on decomposed peat in which pasture growth was measured it was found over two seasons that there was very little growth after the peat dried out in January until the following spring. Therefore considerable attention has been devoted to moisture relationships in peat and methods of maintaining adequate available moisture in the zone in which the pasture plants root.

On the pasture sown on the deep peat on the Rukuhia swamp in April 1950 an endeavour was made to maintain a high water-table during summer and autumn. The side drain was blocked at intervals and kept full of water from an adjacent bore and the water was reticulated through the peat by mole drains. Owing to blockages in the moles caused by timber and the fine sludge and because of the unevenness of the surface the high water-table could not be maintained over the whole area. However, where the peat was kept moist and topdressed with sufficient phosphate and potash production was at a remarkably high level and equalled that of spray-irrigated pasture on clay loam. This work will be described in more detail when further results are available.

Although there is still much to be learnt regarding the development of peat land and some of the projects are necessarily long term, the results so far obtained have already assisted many farmers on peat land in improving their pastures and using the money available for fertilisers to the best advantage.

METEOROLOGICAL RECORDS FOR NOVEMBER

Station	Height of station above M.S.L. (ft.)	Air temperatures in degrees (Fahrenheit)				Rainfall in Inches					Bright sunshine hours
		Approx. mean	Difference from normal	Absolute maximum and minimum		Total fall	No. of days of rain	Difference from normal	Maximum fall		
				Maximum	Minimum				Amount	Date	
Kerikeri	201	60.0	+ 0.9	77.1	42.2	5.18	13		2.20	16	230.3
Auckland	160	61.1	+ 0.7	73.0	49.6	5.16	15	+ 1.70	2.56	12	204.9
Tauranga	10	59.8	+ 1.0	73.5	41.6	4.59	11	+ 1.25	2.28	12	225.8
Ruakura	131	57.2	— 0.2	72.0	40.1	6.14	19	+ 2.44	1.34	12	187.3
Rotorua	969	56.6	— 0.2	72.6	38.0	6.91	16	+ 2.73	3.22	12	190.5
Gisborne	12	61.4	+ 1.9	78.0	38.8	0.62	7	— 1.77	0.21	20	243.0
New Plymouth ..	160	57.0	+ 0.2	66.4	45.8	6.14	21	+ 1.43	1.18	1	157.2
Napier	5	62.2	+ 2.6	80.3	39.6	2.80	8	+ 0.75	1.68	19	215.4
Kariol	2125	52.8	+ 0.9	69.0	37.0	6.45	18	+ 2.54	1.64	12	
Wanganui	72	58.9	+ 0.7	73.9	44.8	4.98	20	+ 1.88	1.21	12	196.4
Palmerston North .	110	57.4	+ 0.5	72.5	39.5	7.20	21	+ 3.93	1.86	12	145.5
Waingawa	350	56.8	+ 0.7	72.2	34.0	3.03	16	+ 0.59	0.64	12	199.3
Wellington ..	415	55.6	— 0.2	65.3	39.4	5.79	18	+ 2.61	1.74	1	179.0
Nelson	24	57.4	+ 0.3	73.4	38.3	6.07	17	+ 3.13	1.35	28	212.7
Blenheim	12	57.7	+ 0.3	76.8	35.4	5.24	16	+ 3.46	1.34	1	230.7
Hokitika	12	53.0	— 0.8	66.7	41.2	15.94	25	+ 5.40	4.11	28	132.1
Hanmer Springs ..	1225	53.0	— 0.8	74.0	29.5	2.95	14	— 0.52	0.72	12	171.0
Christchurch ..	22	56.8	+ 0.5	79.4	33.4	1.27	10	— 0.53	0.25	27	174.7
Ashburton	323	55.8	+ 0.1	73.8	31.4	2.31	10	— 0.12	0.61	28	174.2
Timaru	56	56.2	+ 0.7	81.0	35.7	1.74	11	— 0.20	0.44	7	182.3
Alexandra	520	56.4	+ 0.0	79.0	36.2	2.58	14	+ 1.42	0.58	7	171.4
Taieri	80	54.0	+ 0.6	76.0	37.2	5.28	24	+ 2.93	0.68	24	115.3
Invercargill ..	32	53.6	+ 0.8	73.0	39.0	3.35	21	— 0.66	0.57	7	145.3

Radio Broadcasts

RADIO broadcasts to farmers will be given as follows from Station 1XH Hamilton at 12.30 p.m.:—

7 February—"Simple Farm Remedies", by D. W. Caldwell, Veterinarian, Department of Agriculture, Hamilton.

14 February—"Pasture Establishment on Hill Country", by H. M. Bull, Instructor in Agriculture, Department of Agriculture, Hamilton.

21 February—"Farming Prospects for 1952", by S. Smith, president, Waikato branch of Federated Farmers.

28 February—"Some Aspects of Pasture Establishment on Peat", by I. L. Elliott, Assistant Superintendent, Department of Agriculture Soil Research Station, Rukuhia.

The following broadcasts will be given from Station 2YZ Napier at 7 p.m.:—

5 February—"Cleaning Milking Machines", by J. A. Power, Farm Dairy Instructor, Department of Agriculture, Waipawa.

19 February—"Care of Bees", by L. A. Griffin, Apiary Instructor, Department of Agriculture, Hastings.

Other talks are given from 1YA Auckland on Tuesdays at 12.35 p.m. and Wednesdays at 7 p.m., 1YD Auckland on Thursdays at 7.30 p.m., 1XN Whangarei on Mondays and Wednesdays at 8.10 p.m., 1YZ Rotorua every second Thursday at 7.15 p.m., and 4YA Dunedin on Thursdays at 12.35 p.m.

Fixed Blade for Uncapping Honey Combs

UNCAPPING of combs is such an important phase of honey extraction that the degree of efficiency achieved in this operation often determines the capacity of a honey house plant. The fixed uncapping blade described in this article by I. W. Forster, Apiary Instructor, Department of Agriculture, Oamaru, is giving excellent results to the beekeeper who devised it and is well worthy of the notice of beekeepers generally.

THE process of uncapping honey combs does not lend itself readily to mechanisation, so this operation in the main is an entirely manual one. The usual method of plying a knife or plane while supporting the comb in a suitable position imposes considerable physical strain on the operator.

Uncapping machines have been in existence for many years. The foot-operated type appeared in the 1880's and the power-driven, steam-heated version has been available for over 25 years. These machines invariably consist of a stand on which a blade is mounted horizontally with the cutting edge uppermost. The blade oscillates with a ½in. movement at about 800 strokes per minute and the operator pushes the comb downward across the blade. The tension caused by holding the comb against the vibrations of the blade seems to cause undue strain on many persons, and uncapping machines have never achieved much popularity as standard honey house equipment.

Fixed Blade

The fixed blade is a simpler application of the same principle as the uncapping machine, but the blade being two edged can be used for upward as well as downward strokes.

The advantage of this appliance over a knife or plane is that only one object (the comb) has to be handled. Instead of one hand being used to hold the comb against the push of the other hand wielding the knife or plane the strength of both hands and the full attention of the operator are concentrated on the uncapping stroke. This uncapping stroke obtains maximum efficiency for the amount of energy applied, owing to the rigid fixing of the blade that is taking the thrust.

Making the Appliance

The fixed blade is made as follows:—

The cross-bar is a piece of timber 2in. x 3in. which can be firmly fixed across the uncapping can.

The supports for the blade are 6in. lengths of ⅜in. steel rod threaded for over half their length. These supports are passed through holes bored in the wooden cross-member and held firm by nuts screwed up to the timber on either side. The long ends of the rods protrude horizontally for about 3in. and are approximately 11in. apart.

The blade, which must be of good-quality steel, can be fashioned conveniently from an old lawn-mower or scythe blade. It is 14in. to 16in. long, about 2in. wide, and for the last 1½in. at each end the sides curve inward to form a point.

The blade is welded to the supporting rods so that there is 1½in. to 2in. of the blade at each end protruding past the supports.

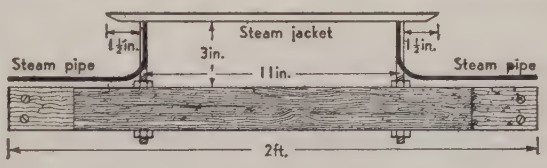
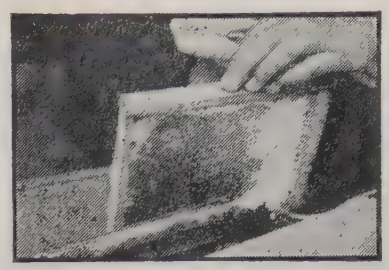


Diagram of fixed blade viewed from above.

All edges of the blade are sharpened from the outside. This is most important, for if the bevelled face is not toward the comb, the depth of the cut cannot be controlled.

The steam jacket is soldered to the inside of the blade. The steam pipes leading to and from the jacket must be brought along the top of the supports to keep these clear of cappings that would otherwise build up and clog the knife at those points.



Uncapping a sunken strip with the point of the blade.

Using the Appliance

The method of using the appliance is as follows:—

Hold the comb on end with the left hand at top and the right hand at the bottom and extended downward at full arm's length. The bottom edge of the blade should be about 4in. up from the lower end bar. Next engage the surface of the comb with the under cutting edge and pull the comb upward to uncap the lower strip. Then immediately swing the top of the comb over to bring the lower edge of the portion still capped into contact with the upper cutting edge and thrust the comb downward with a slight slicing motion to complete the uncapping of that side of the comb.

Sunken patches of cappings are dealt with by using the pointed ends of the blade and top and bottom bars are trimmed with downward strokes across the upper edge.

It is best to trim the top bar, uncap one side, trim the bottom bar, and then uncap the remaining side. This sequence requires no unnecessary turning of the comb and in repetition work such as uncapping, the smallest economy in time on each operation adds up to a big saving by the end of the day.

To operate a fixed blade it is necessary to have a cappings container deep enough to give 20in. clearance between the bottom of the blade and the top of the cappings. The uncapping bin must also be 9in. wider than the blade to give 4½in. clearance on each side to allow any sunken patches of capping to be reached by the ends of the blade.

The main points to remember are:—

Affix the blade at a height that is comfortable for the operator.

Sharpen the knife from the side that faces the comb.

Lead the steam tubes along the tops of the supports.

Have sufficient clearance below and to the sides of the blade to allow free manipulation of the comb.

Some perseverance may be required before an operator becomes adept in the use of the appliance.

Left—Trimming the top bar. Middle—Making the initial upward cut. Right—The main downward uncapping stroke.

The Mountain Pawpaw: A Giant Herbaceous Plant

By P. EVERETT, Orchard Instructor, Department of Agriculture, Auckland

ABOUT 20 years ago several mountain pawpaw plants were raised at Kerikeri in Bay of Islands County. These plants produced their first crop when 2 years old and are still producing good crops of edible fruit each year. In more recent years many more plants have become established in various parts of Auckland Province and a limited quantity of the fruit is marketed each year. The crops of fruit vary greatly on different plants, according to soil type, situation, etc., but generally the crop is not more than 1 to 2 bushels per mature plant each year.

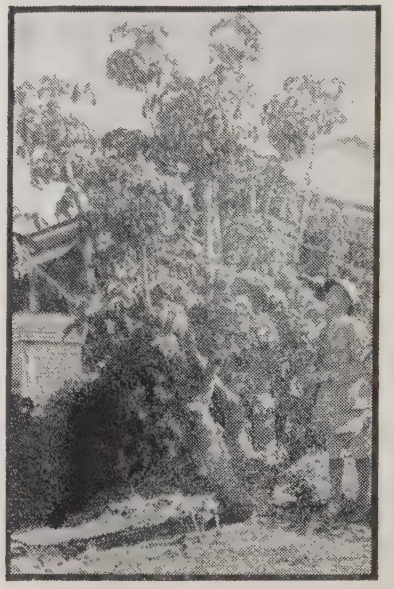
ORIGINALLY found in the mountains of tropical America, the mountain pawpaw (*Carica candamarcensus*, Hook f.), also referred to as papaya, is closely related to the true pawpaw (*Carica papaya*), which is tropical in its requirements and is extensively grown in many countries. The true pawpaw is readily raised from seed outdoors in New Zealand during late spring and summer, but seldom survives the first winter. It has rarely borne fruit in New Zealand except under glass, although many attempts have been made. The mountain pawpaw is appreciably more frost resistant than the true pawpaw and will withstand without serious injury a temperature of about 28 degrees F. after the plants become well established. It is a giant herbaceous plant growing to a height of 15 to 20ft. Branches generally develop the second or third season after the plant is set out in a permanent position. The large, deeply lobed leaves are clustered at the tops of the stems, and immediately beneath the leaves the fruits are attached to the stems. Fruits are present on the plant throughout the year, but ripen mainly from October to January inclusive, although a limited number are liable to mature at any time. The fruits are 3 to 4in. long, have five distinct ribs, are pointed at the blossom end, and are green, changing to yellow when ripe. The creamy flesh is much thinner than is normal with the true pawpaw, being only ¼ to ½in. thick and enclosing a large seed cavity which contains many round, wrinkled seeds about ⅛in. in diameter and an edible pulp.

The fruit has a sweetish, acidulous, perfumed taste and can be eaten fresh or stewed or made into jam. It can also be used as an adjunct to fruit salad. The pulp containing the seeds and the fleshy outer portion are both edible. The fruit is claimed by some to be good for persons with weak stomachs and particularly good for dyspeptics.

The mountain pawpaw will thrive in a wide range of soil types provided there is good drainage throughout the year. Heaviest crops are produced on fertile soils. Though abundant soil moisture is desirable, the plants will withstand considerable periods without rainfall or irrigation and not show marked ill effects.

The plants are raised from seed, which should be sown in late spring, either under glass or outdoors and are suitable for planting out when 9in. or more in height. Planting out can be done at any time when there is ample soil moisture, except during winter and early spring. Plants should be spaced about 10 x 10ft. and will benefit from frequent shallow cultivation and liberal manuring. Organic nitrogenous manures give good results and should be applied in early spring and worked into the soil to a depth of 3 to 4in. over the whole area occupied by the plants.

For marketing, the fruit should be harvested as soon as the green starts to disappear, but when required for home use should be allowed to remain on the plant until completely yellow and then stored for a few days to complete ripening. The fruit has poor keeping qualities and requires to be handled with extreme care to prevent bruising or other injury which may permit the entry of fruit-rotting fungi.



Mature mountain pawpaw plant with multiple branches.

Plants raised from seed may be any one of three types, male, female, or monoecious. The flowers produced on male plants are nearly all staminate (male), but very occasionally pistillate (female) flowers may be produced and result in a few fruits developing. Such fruits are generally borne on long pendulous stems and are often misshapen. Female plants produce all or nearly all pistillate flowers, but there are in some cases a few staminate flowers produced which serve for pollination purposes. Monoecious plants produce large numbers of both flower types. The fruit on female plants is generally produced either singly or in pairs, but trusses containing three fruits occasionally develop. The fruit is appreciably larger than that produced on monoecious plants. The monoecious type of plant bears fruit in trusses, which may each carry up to 20 or more fruits. There is no known means of distinguishing the different kinds of plants until flowers are produced.

The only disease or pest so far found to be attacking the mountain pawpaw in New Zealand is a common species of thrips which may cause a silvery appearance on the fruit and foliage. This pest is readily controlled by spraying with nicotine sulphate, using 2 teaspoons in each gallon of water. One per cent. of summer spraying oil should also be added.

Although the fruit of the mountain pawpaw is not appreciated by everyone, the large and unusual leaves make the plant distinctly ornamental and worthy of a place in sheltered gardens where only light frosts occur.

[*National Publicity Studios photo.*

The large trusses of fruits on a young mountain pawpaw plant are typical of the monoecious type.

SEED PRODUCTION IN NEW ZEALAND

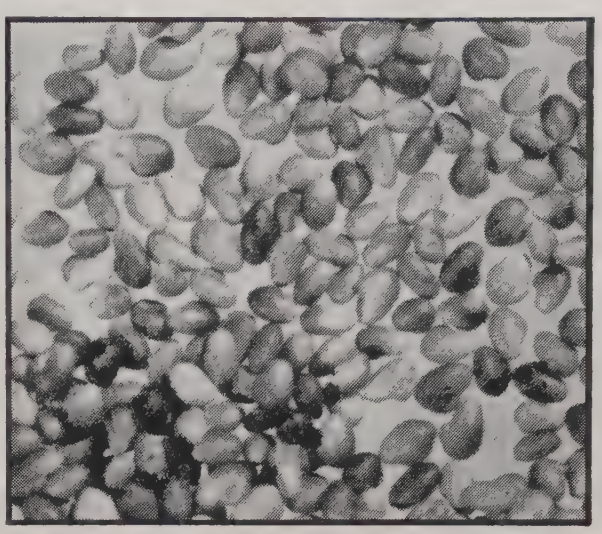
Seed Cleaning: Grasses and Clovers

By P. R. BARRER, Instructor in Agriculture, Department of Agriculture, Christchurch

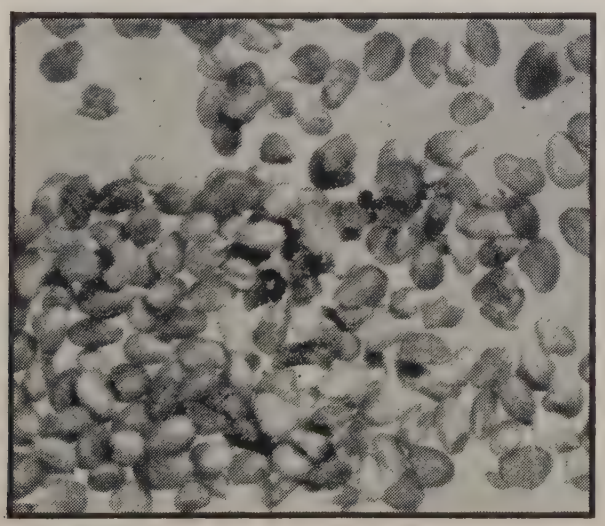
THE extent of the grass and clover seed industry in New Zealand and its value not only to the export trade, but also to the home consumer were shown in the first article in the "Seed Production in New Zealand" series, which appeared in the March 1948 issue of the "Journal". When it is realised that between £1,500,000 and £2,000,000 worth of seed has been exported annually over the last 4 years, and that this is less than the quantity of seed used within New Zealand, it is obvious that an efficient seed-cleaning industry is essential not only for the reputation of New Zealand seed overseas, but also for the benefit of New Zealand pastures. The seed-cleaning machines in use in this country and which are responsible for the good results achieved are very largely of local invention and manufacture.

IN the pre-mechanical age the flail was used to free grain and other seeds from their stalks and the wind to separate the chaff and light material from the seeds. The first crude threshing machines incorporated a series of mechanically operated flails, while the use of a rotary fan to provide an air blast led to the first seed-cleaning machine, termed a winnower. In 1788 Andrew Meikle, Whiterock, East Lothian, England, patented his revolving drum, which worked inside a concave, and which combined in one machine the operations of the flail and the winnower. His machine did a lot its predecessors had not done; it combined a striking and a rubbing action to free the seed from the stalk. It then separated the seed, chaff, and other small particles from the straw by an agitated screen, finally using air blasts to separate the chaff and other impurities from the seed. Thus was evolved the threshing machine—particularly suited for handling grains—which was (with modifications) until comparatively recent years often the only method used for cleaning grain and other seed. Today the cleaning which is associated with the threshing of the seed is regarded only as a preliminary treatment, the final cleaning or machine dressing being carried out in central stores in up-to-date seed-dressing plants.

In New Zealand the grass and clover seed industry began with the collection of cocksfoot seed, which was first recorded as being saved at Pigeon Bay in 1854. By 1865 huge orders for the seed were coming forward. The method of harvesting adopted was to cut the cocksfoot with a sickle, dry the cut material on the stubble, and sledge or cart it to a suitable place for threshing by flail or other means. Eventually there was a demand for some mechanical method of cleaning the seed, and a Christchurch firm, which had made use of screens in chaff cutters to take out dust and small seeds, produced about 1886 a small machine combining a threshing drum and separating screens, which proved to be very suitable to the Akaroa cocksfoot growers. This small portable mill was intended for use on the farm, but it was not long before the firm developed much more elaborate machinery for the seed-dressing stores which now handle the bulk of seed cleaning in New Zealand.



Machine-dressed red clover seed from the line containing the broken seed illustrated below. The farmer should not always depend on the seed cleaner to make such a good job from a poor sample.



Chipped and broken seed extracted in obtaining the sample shown in the other photograph on this page. With care at harvest this seed should not have been present in the field-dressed seed.

In the earlier part of the 20th century most New Zealand grass seeds were harvested from older pastures, which were in most cases mixed pastures with one species predominant. This being so, naturally there were many impurities in the undressed seed.

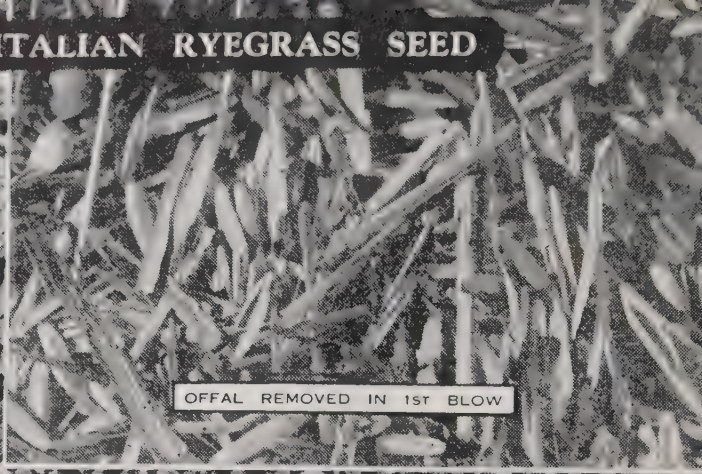
In August 1912 A. H. Cockayne, speaking at the Dominion conference of the Farmers' Union in Wellington, said:—

> The extremely impure nature of much of our local seed in the rough has led to a system of seed cleaning that is unexcelled in any part of the globe. Thus we have the extremely peculiar and interesting position of undressed local seed being probably the dirtiest in the world, while dressed seed of the same lines is, without doubt, unequalled in any seed-producing country so far as freedom from extraneous seeds is concerned.

In 1912 the methods of harvesting and threshing of grass and clover differed from the labour-saving methods employed today. The English type of threshing mill which was then in general use in New Zealand had not undergone any fundamental changes in design since the first half of the 19th century. It made quite a fair job of cleaning out most of the impurities. Though the much more recent header harvester employs the same fundamental principles in its operation, it combines into one readily manoeuvrable machine the functions of the reaper and the threshing mill. The combination with all its advantages has one drawback; a limit to the space available in which to incorporate the various parts. Thus the sample produced by the header harvester cannot be expected to be as pure as that produced by the much larger threshing mill. Against this the great majority of seed producing areas are sown today with seed production in mind, and usually only two species—one grass and one clover—are sown in these areas, which

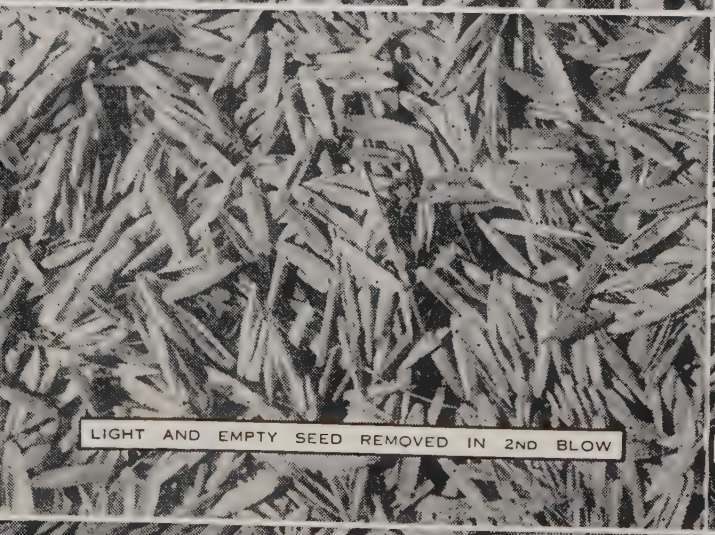
MACHINE DRESSING OF ITALIAN RYEGRASS SEED

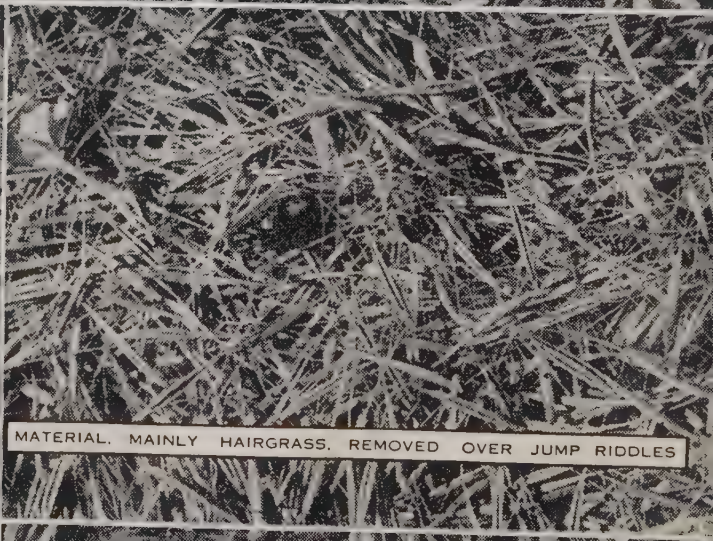
FIELD DRESSED SEED BEFORE MACHINE DRESSING

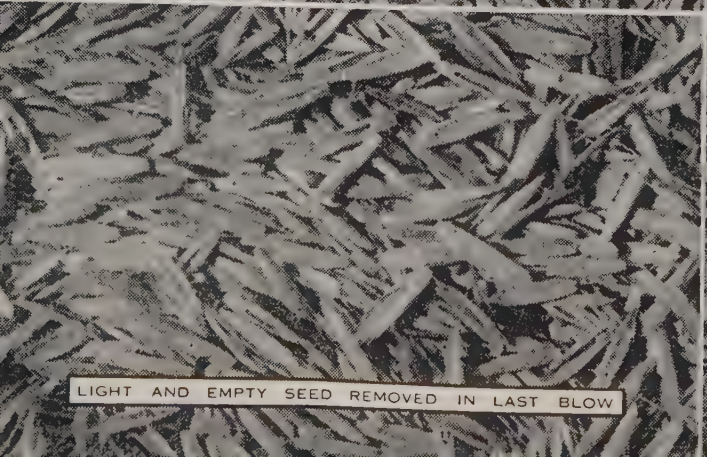

OFFAL REMOVED IN 1ST BLOW

OFFAL REMOVED OVER 1ST RIDDLES

WEED SEEDS REMOVED IN CYLINDER SEPARATION


LIGHT AND EMPTY SEED REMOVED IN 2ND BLOW


MATERIAL, MAINLY HAIRGRASS, REMOVED OVER JUMP RIDDLES


LIGHT AND EMPTY SEED REMOVED IN LAST BLOW

FINAL PRODUCT· MACHINE-DRESSED SEED

are harvested for seed early in their life. Thus though the header harvester has almost entirely replaced the threshing mill, the effect has been offset by the change in seed production methods. Consequently seed-cleaning plants still have a similar task to perform, the removal of weed seeds, other crop seeds, broken seeds, pieces of straw, and other rubbish from the field-dressed seed.

Separation Principles and Devices

In the separation of weed, grass, and clover seeds, dirt, chaff, straw, and other foreign matter, including broken seed, principles are used according to the impurities in the line. The varying characteristics of the seeds and foreign matter have been made use of in devising the methods for eliminating them. These main characteristics are size, shape, and specific gravity.

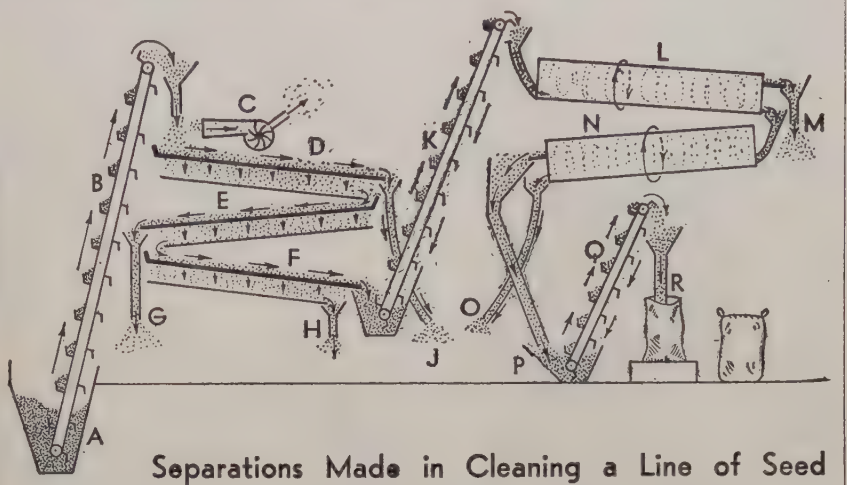
The most generally useful device in seed-cleaning machinery is the riddle, which depends upon size and shape differences for its usefulness. The perforations in a series of riddles reveal a great variety of shapes and sizes suitable for separating many kinds of impurities. The main riddle types include round and oblong holes punched into sheet zinc, and wire mesh giving square and various oblong openings. Opening sizes range from the equivalent of the smallest seeds harvested to the largest, the range used in any particular plant depending on the types of seeds handled. Three prime motions used in the operation of riddles are to and fro, up and down, and crosswise. A combination of to and fro and crosswise will give a rotary motion. Again the riddles may be run on eccentrics on a steel spindle, thus combining to and fro and up and down to give the seed a jumping motion. In the seed trade such a machine is known as a "jump machine". In addition to the type of motion of riddles, they may also be run at different speeds and pitches.

Another device making use of size and shape is the cellular cylinder. This, too, may be obtained with a large variety of shapes, sizes, and angles of indentations or cells in the inner surface of the cylinder. Cellular cylinders are fitted at an angle to the horizontal. As the cylinder slowly rotates material is picked up in the cells, leaving behind in the bottom of the cylinder anything too large to fit into the cells. As the material is lifted upward by the cylinder that of greatest length falls out first and returns to the bottom. Shorter material is lifted higher and when it does fall it is caught in a suspended trough running the length of the cylinder. The position of this trough or tray can be adjusted to make a separation at an earlier or a later stage in the cycle of the cylinder. The material remaining in the bottom of the cylinder works along and is caught at the lower end, while that gathered in the tray is taken away separately. Thus a cylinder will make separations with great accuracy in material of the same shape in cross-section but varying in length. Such a separation would be an impossibility over riddles.

In using air currents in a dressing plant advantage is taken of variations in specific gravity, by which chaff, straw, and empty glumes may be separated from sound seed, and lighter seeds such as grasses may be separated from denser seeds such as clovers. The current of air formerly obtained by blast is now more usually developed by suction. The strength of the current can be adjusted according to the line of seed being cleaned.

A modern machine-dressing plant consists of a number of different types of machines, linked up as required into one plant, so that any line of seed may be fed into the hopper and go automatically through as many processes as are necessary for thorough cleaning. Sometimes lines will have to go through the same process twice.

The separations made in a line of Italian ryegrass are shown in the illustrations on page 14.



Separations Made in Cleaning a Line of Seed

The number of separations made in cleaning a line of seed will depend both on the kind of seed and its condition before machine dressing begins. The accompanying flow diagram, though not that of any particular machine nor giving the order in which the component parts may be used or the numbers of the parts, illustrates a link-up of elevators, blast, riddles, and cylinders, which are essential in most cleaning operations. The following is a description of the labelled parts:—

A—Hopper for field-dressed seed, usually built with the top just above floor level and large enough to hold several sacks of seed.

B—Elevator to lift field-dressed seed to machine.

C—Air suction to remove light chaffy material.

D—Top or scalping riddle; the largest impurities in the line are retained on this riddle, the balance passing through it.

E—Second riddle, with similar function to the top riddle, but separating impurities more nearly the size of the seed being cleaned. This riddle may be employed to remove the largest seed or to carry over the main run of seed and allow only the smallest seed to pass through with small impurities.

F—Third riddle; the seed being cleaned, together with impurities of similar size, pass over this riddle, smaller impurities passing through it.

G, H, and J—Spouts at which the separations made by riddles E, F, and D are collected.

K—Second elevator, lifting riddled seed to cylinders.

L—First cylinder, which separates material of shorter length than the seed being cleaned, lifting it into the cylinder tray.

M—Discharge point for material separated in first cylinder.

N—Second cylinder, which separates material of greater length than the seed being cleaned. The dressed seed is lifted into the cylinder tray while the separated material passes along the bottom of the cylinder.

O—Discharge point for material separated in second cylinder.

P—Hopper into which machine-dressed seed is delivered.

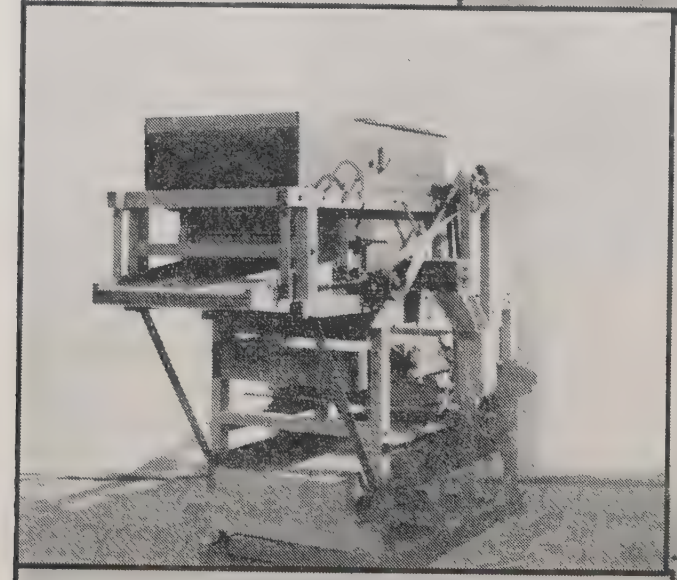
Q—Elevator lifting machine-dressed seed to bagger.

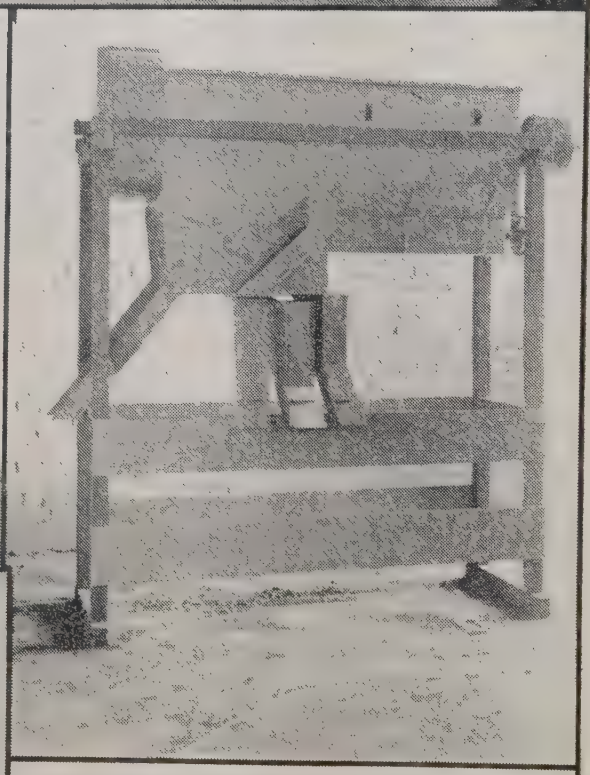
R—Bagger for machine-dressed seed.

Photographs on opposite page by Green and Hahn Photography Ltd.

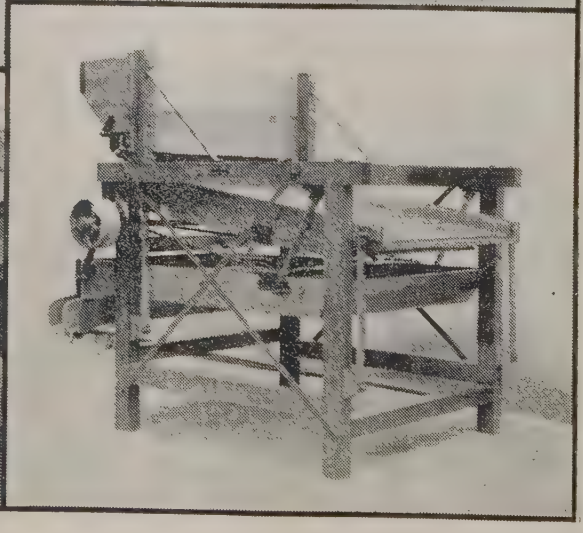
SEED-CLEANING MACHINES

Right—A machine-dressing plant which was in use over 40 years ago and which with many additions is still working today. Lower left—A "jump machine" in which riddles for separating seed are run on eccentrics on a steel spindle to give the seed a jumping motion. Lower right—A polisher, which uses brushes over a wire concave.





Lower left—A seed cleaner used for dressing on the farm. Note the cellular cylinders which are fitted at an angle to the horizontal. A cylinder will make separations with great accuracy in material of the same shape in cross-section but varying in length. Lower right—A scalping machine removes the larger pieces of straw, seed stalk, and other impurities from the line.



Subsidiary Separating Devices

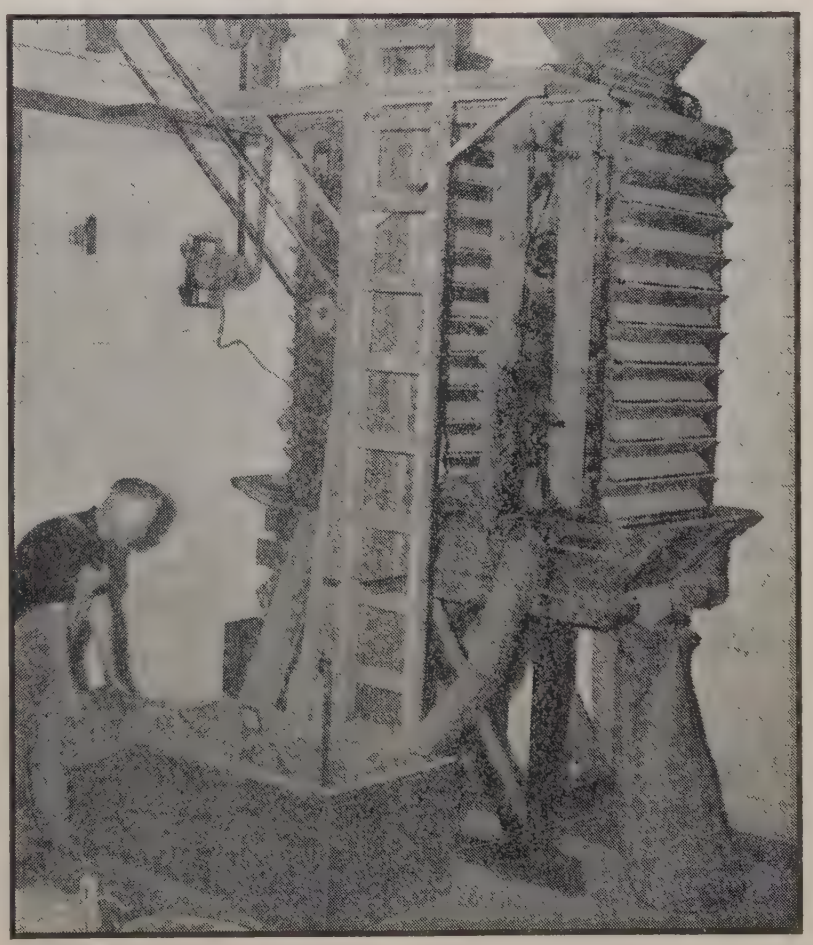
There are a number of subsidiary separating devices which may be required to deal with special classes of seeds or to improve the purity of difficult lines of seed. The dossor is a machine used commonly in the cleaning of clover. It makes use of revolving velvet surfaces on which irregular, flat, and broken seeds are carried up and round seeds roll down.

Another less usual but effective device has been incorporated in a machine which is particularly useful as a final process in removing chipped and broken seed from clovers. Magnetism is used to effect separation, it being necessary to mix a very small quantity of iron filings with the clover, the filings adhering to the broken surfaces but not to the whole seeds. Still another machine, by using wind and differing specific gravities of seed, is often able to separate seed of similar size but different weight with which riddles and cylinders may not be able to deal. In this machine, known as a specific gravity separator, a current of air passing upward through a perforated jumping table keeps the seed continually in motion and makes a number of very fine separations based on variations in the specific gravity of the material being handled. Saddlers' felt or similar blanket material is sometimes used to separate "clinging" from other types of seeds. The material is suspended on a horizontal plane above the riddles of a jump machine. The action of this machine throws the seed against the under side of the material. Seeds such as sweet vernal adhere to the matted surface, while other seeds fall back to the riddle. The blankets require cleaning periodically if they are to retain their effectiveness.

The hummeller is used to remove husks from seed or grain and to clip the long ends off oats. It is fitted with cutting knives or brushes according to the work to be done. At the outlet an air suction draws away all light material rubbed off by the hummeller. Brushes may also be used as other adjuncts to the seed-cleaning process. They may be used underneath the riddles or screens to prevent them becoming blocked with seed, so that uniform work may be ensured throughout the cleaning operation. For the shelling of some seeds such as Yorkshire fog, the brushes separate the shells from the kernels, the cylinders lift the kernels away, and an aspirator removes the husks by suction. Again, brushes may be used for breaking up double heads of cocksfoot as well as for brushing up a sample to make it flow better when it is being sown, or they may be used in breaking up soft dirt in subterranean clover seed so that the dirt may then be removed.

Polishers make use of brushes working over a wire concave. They are used by seed-dressing firms to break

Field-dressed clover seed in receiving bin of dressing plant.



The dossor, a "finishing" machine for clover seed.

Photographs on opposite page by Steffano Webb.

Write for free illustrated catalogue to
Speedway Products Ltd.,
26 Albert St., Auckland.
South Island Distributor:
A. H. Turnbull & Co. Ltd.
Christchurch.

SP-1-3

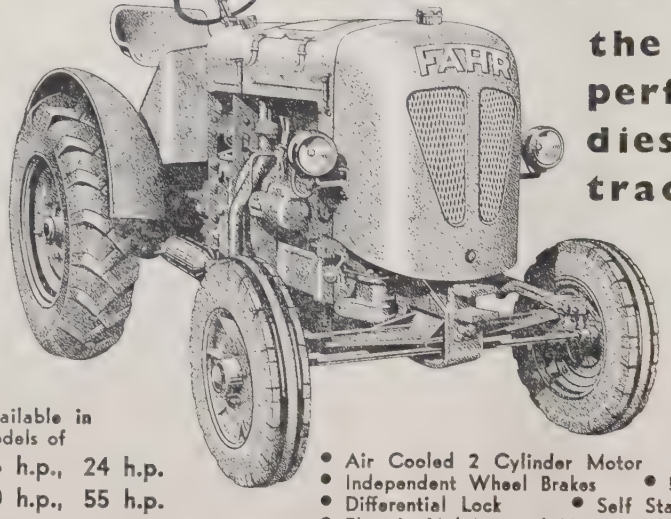
Protect birds from NUTRITIONAL ROUP during dry spells

By feeding Vite-ADee Poultry Emulsion regularly. Because green feed is scarce and its essential Vitamin A content is low during prolonged hot weather — *Nutritional Roup has a chance to strike!* Simply, cheaply, effectively, Vite-ADee Poultry Emulsion protects your flock. It costs only a few pence per hundred birds per week to give them full potency Vitamins A and D3 to maintain stamina and general health.

feed Vite-ADee POULTRY EMULSION

W. & R. FLETCHER (N.Z.) LTD.,
P.O. Box 594, Wellington.

FAHR



the perfect diesel tractor

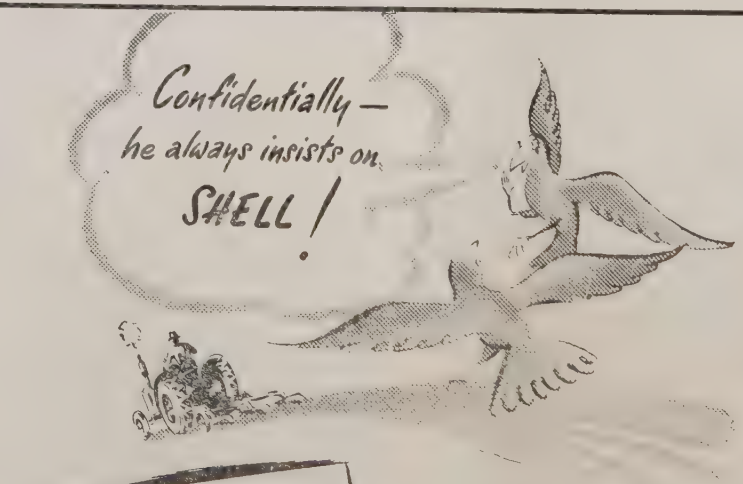
Available in models of
16 h.p., 24 h.p.
30 h.p., 55 h.p.

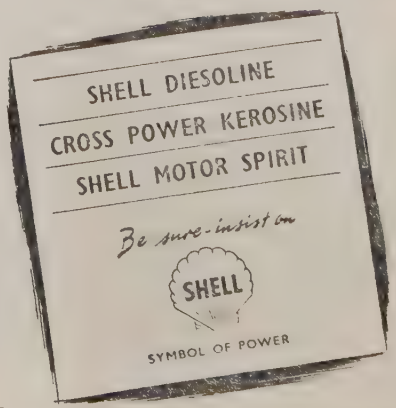
Enquire today from the nearest branch of

- Air Cooled 2 Cylinder Motor
- Belt Pulley
- Independent Wheel Brakes
- 5 Forward Gears
- Differential Lock
- Self Starting from Cold
- Electric Lighting and Horn
- Power Take Off
- Hydraulic Controls
- Front Wheel Springing
- Separate Hand Brake

DORING IMPLEMENT SUPPLIES LTD.

P.O. Box 1179, Wellington.
P.O. Box 632, Hamilton.
P.O. Box 548, Palmerston North.
P.O. Box 1203, Christchurch.
P.O. Box 99, Gore.





He is a wise farmer who insists on SHELL Diesoline, CROSS Power Kerosine or SHELL Motor Spirit for his tractor. Shell tractor fuels give not only the utmost in power and economy, but a clean-burning efficiency that stretches the time between major overhauls.
Yes, the shrewdest owners know 'you can be sure of SHELL!'

THE SHELL COMPANY OF NEW ZEALAND LIMITED
(Incorporated in England)

TF1.1B

up small particles of dirt in clover, particularly white clover. Suction draws off the light material rubbed off by the polisher. The polisher may also be used to decrease the percentage of hard seeds in clovers.

A "bounce" machine uses the resilience exhibited by sound pea seeds to separate them from damaged seeds and from pieces of dirt of similar size. The material to be cleaned is bounced on to a series of plate-glass surfaces which are set to allow a separation according to the resilience of the material.

An electronic "eye" is used to make a separation according to seed colour. Thus discoloured and weathered peas can be separated from sound peas, and yellow seeds of linseed from brown seeds. Each seed comes individually under the "eye" and is graded according to colour.

A Christchurch firm which has specialised in the production of seed-cleaning machinery from early days supplies not only most of the New Zealand market, but exports seed-cleaning machinery to Australia, Scotland, and Ireland. Improvements continue to be made not only in the design of existing machinery, but also by the invention of new devices, as for instance a recent patent for the removal of flat from round seeds in the dressing of clovers and brassicas.

Seed-store Procedure

Individual stores have their own methods and techniques, but there are certain general practices carried out in all stores. To understand the seed-store procedure it is necessary to follow a line of seed through the store from the time it enters to the time it leaves.

All seed coming into store is first weighed in the wagon or truck on a weigh bridge, the tare weight of the conveyance being deducted to give the weight of the bags and contents, or the gross inward weight. The net inward weight of the seed is that obtained by deducting the weight of sacks from the gross inward weight.

Grass seed-dressing plant, showing cylinders.

As the wagon is unloaded and a tally made of the number of sacks every bag is sampled to see that all sacks are similar in their contents. The line is then stacked to await its turn for machine dressing. Various methods may be used in stacking, but nearly all firms now use an electric hoist.

Should the line be one with a marked variation in quality, due perhaps to a different pasture composition or treatment of the area or to threshing at different times or under different conditions, it is advisable for the farmer to keep the two parts of the line separate and to advise the firm accordingly. The variation may be noticed by the storeman at sampling, when the line comes in, but if it is overlooked and the sacks are not marked, dressing difficulties are created, as a separate dressing of each part cannot be carried out. Also sacks the contents of which are obviously dirty or sacks containing seconds should be marked before they leave the farm so that they will be easily identified and handled separately in the store to ensure uniformity in dressing.

Finishing section of ryegrass seed-dressing machine.

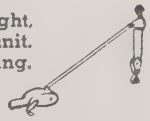
It is usual for lines of seed being dressed on account of clients to be dressed in the order in which they come into the store. When the line is taken down from the stack for dressing the seed is tipped into the hoppers and the sacks put aside for cleaning. An efficient sack cleaner is a very necessary piece of machinery in a seed-cleaning store. All types of seeds cling to the sacks inside and out, particularly seeds such as hairgrass, Italian ryegrass, sweet vernal, burr clover, and other rough seeds. A good sack cleaner removes all these seeds and the sacks may then be used as clean "once-shot" containers for seed, seconds, offals, meals, and other purposes.

On coming off the dressing machine the machine-dressed seed is generally put into new sacks, each containing a standard weight of seed. After being sewn, the sacks are branded with the identification line number of the firm and a description of the seed. In the case of Certified seeds official samples are then drawn and the sacks are tagged and sealed. The seed is then ready for further storage, which means restacking, or for removal from store. The outward weight is the net weight of machine-dressed seed. The various

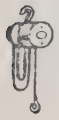
LIFTING — SHIFTING

ROPELOCK
This reliable rope hoist will lift up to ½ ton. Special "Ropelock" feature, which holds load when rope is free. Good for horizontal and angular pulling as well as vertical lifting.

MINILIFT
Portable, light weight, efficient lifting unit. Geared for easy lifting.



Aluminium Alloy construction.
Models to lift 8 cwt. and 15 cwt.



HAND CHAIN HOIST
High efficiency, spur gears. Totally enclosed mechanism. Capacities, 5 cwt., 10 cwt., etc., up to 10 tons.

KING ELECTRIC PULLEY BLOCK
Will work wherever there is electric power. This efficient hoist will lift loads up to 3,600lbs. at the touch of a button.

WOOL BINS
For efficient sorting and handling. . . . Strong, manoeuvrable, capacious, smooth finish. ... Supersedes the wicker basket.

MASTER TRUCKS
The balanced hand truck for sacks, bales, cases, etc. Roller bearing wheels give easy rolling with heavy loads.

DRUM DRAINERS
Makes tilting, pouring 44 gallon drums a ONE man job. ... Safe, no waste.

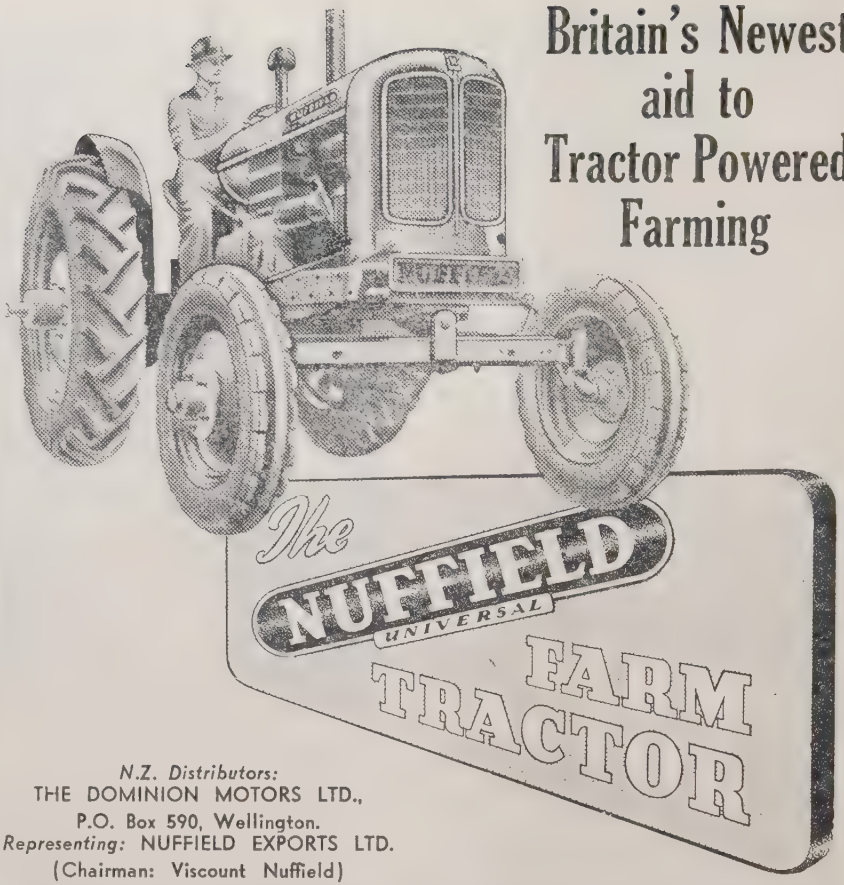
MECHANICAL MOKE
Inexpensive power barrow. Tip body or flat deck.

12 cwt. capacity.

Write for booklet giving all details.

MATERIALS HANDLING EQUIPMENT CO. LTD.
GRACEFIELD RD., LOWER HUTT.

Britain's Newest aid to Tractor Powered Farming



N.Z. Distributors:
THE DOMINION MOTORS LTD.,
P.O. Box 590, Wellington.
Representing: NUFFIELD EXPORTS LTD.
(Chairman: Viscount Nuffield)

Rotational Grazing *made EASY!*

No other method of rotational grazing is as easy —as economical. COMPANION Electric Fences will save you high labour costs, fence posts, wire, gates, etc.—and they're so simple to instal.

Instal COMPANION Electric Fence Units and prove that your farm can carry more cows per acre, give a greater yield, earn greater profit.

AGENTS IN ALL CENTRES

Manufactured by SWAN ELECTRIC CO. LTD.,
P.O. Box 307, Auckland. CF1.9

COMPANION ELECTRIC FENCE UNIT

seconds and offals extracted are also bagged and their descriptions and weights recorded.

Seconds and Offals

Farmers frequently have the impression that a lot of good seed goes out in the seconds or offals at machine-dressing time. Seconds is the name usually given to the best of the dressings taken from the firsts or machine-dressed seed, while offals refers to the other grades of seeds, weeds, and rubbish which are extracted at machine dressing. An examination of samples of the various separations will show that there is little that could be made use of in seconds and offals. However, sometimes the seconds consist of seed which would warrant further dressing or disposal as seconds. This seed is not as a rule mixed with the firsts, as its purity may not be so high and it may spoil a good line of firsts, but sometimes if of similar quality the seconds may be run back through the machines into the firsts. An example of this is where shelled cocksfoot the purity and germination of which are usually as good as those of the firsts is run back in order to increase the bushel weight of the line.

There are instances where two varieties of seed, such as perennial ryegrass and white clover, are harvested together. When this happens the seed dresser aims at getting the most of both varieties by dressing, say, the perennial ryegrass, and extracting most of the white clover in one line, which is then dressed separately on the clover machines. Again, a reasonably pure line of white clover may be separated from a mixture of white and suckling clovers without detracting from the value of the mixture still remaining. In any event, seconds which may be usable are kept by the dressing firm for instructions from the owner of the seed. Genuine offals, however, have to be dumped or destroyed. Though some types of offals have food value when sterilised, ground, and mixed in stock meal—a practice adopted during the war to utilise the feed value of an otherwise waste product—better foodstuffs are now readily available for stock meals and the practice has generally ceased.

Seeds Cleaned in New Zealand

A great variety of grass and clover seeds is produced on New Zealand farms and cleaned by New Zealand-made machine-dressing plants.

In the cleaning process each variety of seed has its own peculiarities and difficulties. There are impurities which due to size and shape will obviously be important when present in certain seeds but which are of no moment in others. Consequently it is desirable to discuss separately each of the seeds more commonly handled.

Perennial ryegrass: As the very high purities indicate, the cleaning of perennial ryegrass now, as 40 years ago, presents few difficulties. However, it is possible to strike trouble in some lines because of the presence of goosegrass which has its awns broken off or is partly or completely shelled. If the awns are left on by the farmer in his harvesting operations (by light threshing), there is generally little difficulty in removing the goosegrass. Farmers with goosegrass in their perennial ryegrass seed production areas should therefore take every care to avoid damage to this seed during threshing. Hard threshing also breaks up straw into small pieces, some of which, being similar in size and shape to ryegrass, may prove difficult to remove in dressing. Cocksfoot, English trefoil in the shell, sweet vernal, and hairgrass are other impurities which occasionally cause difficulty in dressing perennial ryegrass.

Italian ryegrass and short-rotation ryegrass: As Italian ryegrass and short-rotation ryegrass are harvested from young pastures only, there are normally fewer impurities present in the paddock than with many other seeds. Those most likely to present trouble to the seed cleaner are goosegrass and hairgrass. Well-developed ribgrass, unshelled white clover, wild oats, and sweet vernal are other impurities which it is difficult to remove entirely from Italian ryegrass.

Cocksfoot: Of the main grass seeds perhaps the least satisfactory job is made of cleaning cocksfoot because of the great difficulty in removing inert matter consisting mainly of husks which do not contain kernels. Small perennial ryegrass seed, which is of a very similar size and shape to cocksfoot, is also difficult to separate. Cocksfoot seed should therefore be harvested from areas as free as possible from perennial ryegrass. Minor impurities in cocksfoot are goosegrass, ribgrass, Yorkshire fog, and catsear.

Crested dogstail: In crested dogstail seed Yorkshire fog may be the worst impurity, particularly when it is small and becomes shelled, as it may then be almost impossible to separate. Other impurities difficult to eradicate are sweet vernal, hairgrass, white clover, chewings fescue, and small perennial ryegrass.

Chewings fescue: The most objectionable weeds encountered in dressing this seed are catsear, sweet vernal, small ryegrass seed, and hairgrass. Catsear is the worst of these, as, being the same shape, size, and weight as fescue, it is frequently not removed by the riddles or by the cylinders.

Timothy: An increasing quantity of timothy seed is being harvested in New Zealand, mainly in Southland and Otago. Generally the worst impurity in this seed is Yorkshire fog. White, alsike, and suckling clovers are also hard to remove during dressing, and management of timothy seed producing areas should aim at the elimination of these plants as much as possible. Timothy is often appreciably shelled during dressing, but this seed seems to germinate just as satisfactorily as unshelled seed.

Browntop: Two of the worst impurities in browntop are toadrush and yarrow, which are practically impossible to eliminate entirely. Other minor impurities are chickweed, white clover, English trefoil, and hairgrass. An impurity sometimes present and impossible to remove altogether is buck's horn plantain. A large quantity of straw is present in some lines. This is easily separated, and, as dressing charges are based on inward weights, it may pay the farmer to put the line over his header to eliminate some of this waste material before sending it into store.

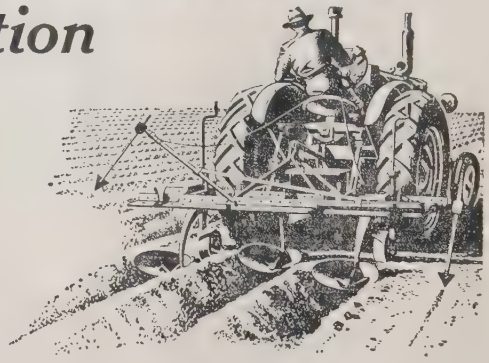
White clover: As the main clover seed produced in New Zealand, white clover has always received particular attention from seed-dressing plants. As with most other seeds, a high standard of purity is generally obtained. Should suckling clover be present in quantity in the field-dressed sample, however, it is not possible to make a clean separation at machine dressing and there must then be heavy dressing losses if it is desired to obtain white clover seed with a reasonably high purity. After suckling clover, the worst impurities are sorrel (with the wings removed), shelled fog, clustered clover, and timothy.

LIST OF BOTANICAL NAMES OF PLANTS MENTIONED IN ARTICLE

Common name	Botanical name
Alsike	*Trifolium hybridum*
Australian flax	*Linum marginale*
Bindweed	*Convolvulus arvensis*
Browntop	*Agrostis tenuis*
Buck's horn plantain	*Plantago coronopus*
Californian thistle	*Cirsium arvense*
Catsear	*Hypochaeris radicata*
Chewings fescue	*Festuca rubra* var. *commutata*
Chickweed	*Stellaria media*
Clustered clover	*Trifolium glomeratum*
Cocksfoot	*Dactylis glomerata*
Creeping buttercup	*Ranunculus repens*
Crested dogstail	*Cynosurus cristatus*
Danthonia	*Danthonia pilosa* and *Danthonia semiannularis*
Dock (broad)	*Rumex obtusifolius*
Dock (curled)	*Rumex crispus*
Dodder	*Cuscuta epithymum*
English trefoil	*Medicago lupulina*
Field madder	*Sherardia arvensis*
Goosegrass	*Bromus mollis*
Hairgrass	*Vulpia* spp.
Hoary Cress	*Cardaria draba*
Horehound	*Marrubium vulgare*
Italian ryegrass	*Lolium multiflorum*
Lotus major	*Lotus major*
Lucerne	*Medicago sativa*
Meadow foxtail	*Alopecurus pratensis*
Milk thistle	*Silybum marianum*
Nassella tussock	*Nassella trichotoma*
Ox-eye daisy	*Chrysanthemum leucanthemum*
Paspalum	*Paspalum dilatatum*
Perennial ryegrass	*Lolium perenne*
Phalaris	*Phalaris tuberosa*
Red clover	*Trifolium pratense*
Ribgrass	*Plantago lanceolata*
Sorrel	***Rumex*** *acetosa* and ***Rumex*** *acetosella*
Spurry or yarr	*Spergula arvensis*
Stinging nettle	*Urtica dioica*
Stinking mayweed	*Anthemis cotula*
Striated clover	*Trifolium striatum*
Subterranean clover	*Trifolium subterraneum*
Suckling clover	*Trifolium dubium*
Sweet vernal	*Anthoxanthum odoratum*
Tarweed	*Odontites viscosa*
Timothy	*Phleum pratense*
Toadrush	*Juncus bufonius*
Vetch	***Vicia*** **spp.**
White clover	*Trifolium repens*
Wild oats	*Avena fatua*
Wild turnip	*Brassica campestris*
Wireweed	*Polygonum aviculare*
Yarrow	*Achillea millefolium*
Yorkshire fog	*Holcus lanatus*

Only FORDSON MAJOR

gives you this combination of advantages!



Features

Built by the organisation with the *longest tractor experience* in the world. That means more and better features — *more efficiency* on every power farming job.

Performance

Power plus for all farm work. Diesel develops 45 h.p. — petrol 36 h.p. Drawbar pull up to 5,300 lbs.

Value

By far the *lowest priced* tractor in its h.p. class. From £439 with deposit as low as £150 and convenient payments under the Confidential A.F.C. Purchase Plan.

Backed by New Zealand's *finest dealer service.*

Point by point — Fordson Major is *the world's best tractor buy! Immediate delivery* from your nearest of the 80 Ford Dealers.

Get the facts . . . and you'll get Fordson Major

FORD MOTOR COMPANY OF NEW ZEALAND LIMITED LOWER HUTT

177

***"Still the cheapest, most efficient Electric Fence available . . .* THE WOLSELEY"**

Yes, more and more farmers are proving that the WOLSELEY ELECTRIC FENCER is cheap to buy, efficient and economical in operation. They're finding also that it's simply and easily erected — easily shifted — trouble-free and weatherproof. It provides a real answer to subdivision, particularly of pastures, allowing them to reap the amazing benefits of rationed grazing.

Prove for yourself that the *Wolseley Electric Fencer* makes it easy.

- A BRITISH PRODUCT
- 5 YEARS' GUARANTEE

Price only £10 8s. 6d. net.

The WOLSELEY Electric FENCER MAKES IT EASY!

Enquire from N.Z. Distributors. **DALGETY & CO. LTD.** All Branches. (Inc. in Eng.)

Cowgrass and Montgomery red clover: The worst impurity in red clover seed is damaged red clover seed itself. If the farmer during his threshing sets his machine too hard, or if he threshes his crop out of condition, he will certainly get a higher proportion of chipped and broken seed. Redressing of such seed may cause to show up even more broken seed which had been damaged at threshing. Badly broken seed can be removed fairly readily, but slightly chipped seed will give most cleaning plants a problem that they cannot handle to either their own or the grower's satisfaction, as it is practically impossible to eliminate this seed which has been injured very slightly from the whole seed. Ribgrass, sorrel, and dock seeds are impurities which are also most difficult to separate completely by machine dressing. The presence of dock seed in red clover has caused complaints from the English market. Other impurities are white clover and dodder.

Subterranean clover: A small but increasing area of subterranean clover is harvested in New Zealand, principally in Marlborough. Owing to the method of harvesting, small stones and soil particles are very common impurities in subterranean clover seed, but although they are troublesome they can usually be separated at machine dressing. Chipped and broken seed may be a bad impurity; this is caused by hard threshing in freeing the clover from the cob. Other impurities which may be difficult to remove entirely are wild turnip, vetches, rape, and striated clover.

Lucerne: Probably the worst impurities in lucerne are ribgrass and red clover. Other impurities which at times are hard to remove altogether are wild turnip, ryegrass, goosegrass, hairgrass, and striated clover.

Purity Standards

In the seed trade the main basis of dealing is on a minimum requirement of 98 per cent. purity and 90 per cent. germination (with the exception of cocksfoot). Generally there is little consideration on the export market for lines of seed which fail to meet these requirements, though as far as germination is concerned this may depend on seasonal conditions. With the main seeds purities of 99 per cent. and over are very common.

Emphasis has been laid on the good job done by most seed-dressing plants. This may be so, but it is as well for the farmer to remember that a line of seed with a purity of 99.8 per cent. and containing as little as 0.1 per cent. of seed of a particular weed or weeds may be unsafe to sow and may be prohibited from importation into other countries. For instance, seeds containing even a trace of bindweed, hoary cress, or dodder are prohibited entry into Australia, U.S.A., and Canada, while lines containing Californian thistle are prohibited entry into Australia and U.S.A. Again, nassella tussock, ox-eye daisy, milk thistle, and tarweed are totally prohibited in seeds for Australia.

Other common weeds which, if present in seeds in excess of a restricted quantity, depending on the seriousness with which the impurity is viewed, will prevent the entry of seeds into Australia are horehound, field madder, stinging nettle, Australian flax, stinking mayweed, curled dock, creeping buttercup, wireweed, spurry or yarr, and ribgrass.

Therefore it is necessary to realise not only that a high purity is important, but that freedom from particular impurities may also be essential.

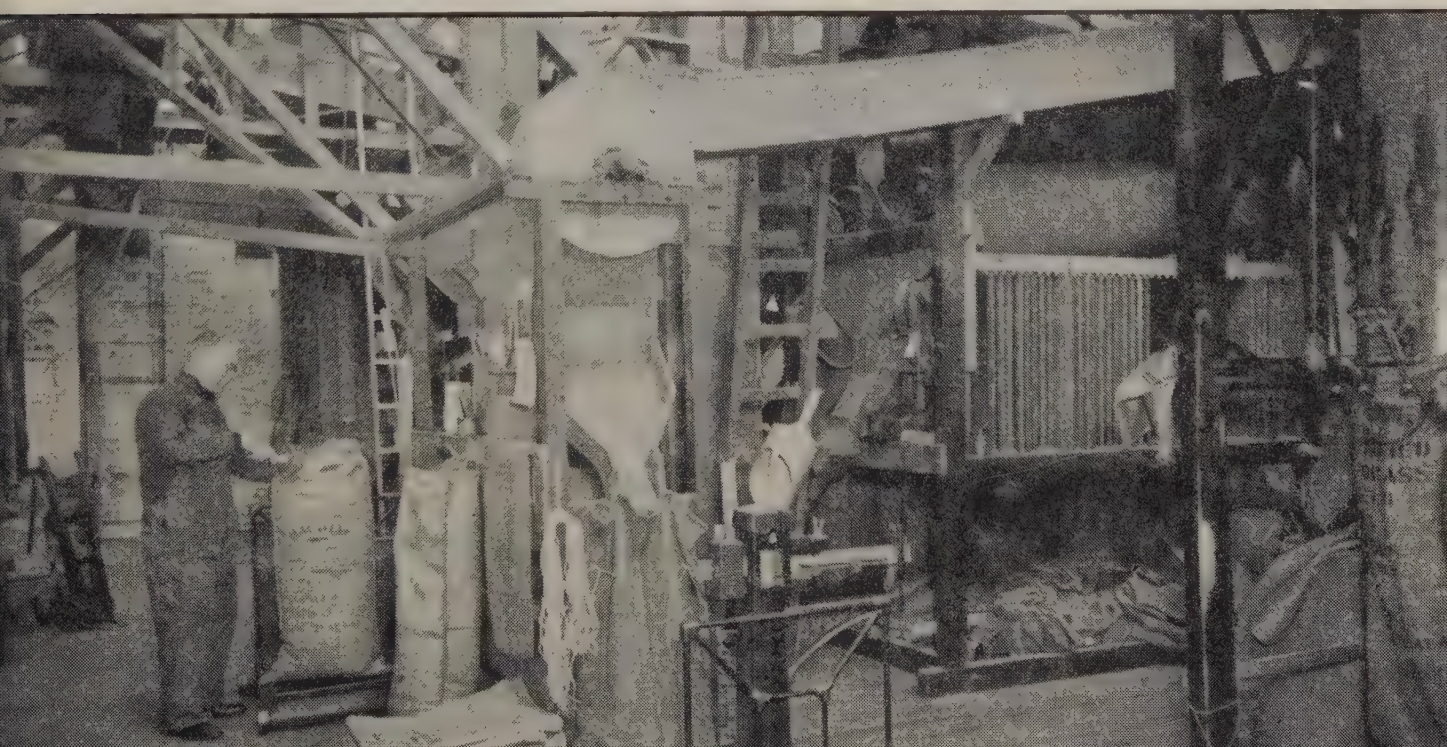
Capacity of Plants and Dressing Losses

Owing to the different arrangements and types of machinery used by different firms, as well as the widely differing state of lines of field-dressed seed, there is no fixed rate for the dressing of any particular grass or clover seeds. However, one typical large plant when dressing ryegrass puts into the machines about 20 to 30 bushels per hour of field-dressed seed and puts into the clover machines about 500 to 600lb. per hour. The outward weight, of course, varies to a great extent, and may be lower than 20 per cent. or higher than 80 per cent. of the inward weight, depending on the impurities taken out. Again, as has been explained it may be necessary to put a line over the machines twice, and this naturally halves the dressing rate. Whatever the rate, it should be remembered that machine dressing is a process which cannot be hurried, but must be done thoroughly if it is to be satisfactory.

Effect of Certification on Seed-dressing Procedure

Now that the bulk of the seed dressed is either certified in the paddock or entered for certification in store after dressing, every care has to be taken to ensure that there is no chance of contamination at the machine-dressing stage. In the larger stores the procedure may be simplified; for example, in the case of the ryegrasses one machine will perhaps handle only lines of perennial ryegrass which are to be entered for certification by type test, whereas another machine takes only seed which has already been certified in the paddock. Another machine will deal with lines of Certified Italian ryegrass. There is then no chance of different types of ryegrass being mixed. However, all firms do not have sufficient plant to be able to do this, but they simplify matters by dressing, say, all lines of available Italian ryegrass first. Then the machine is given a very thorough cleaning down and uncertified perennial ryegrass lines may be put through. After another thorough cleaning, the

BELOW: Finishing section of clover seed-dressing plant.



ROLLED BALES

SAVE HAY the SAFE WAY

The one-man operated Allis Chalmers Roll Baler forms (adjustable for size and weight), wraps (with ordinary binder twine) and ejects the bale entirely automatically. Best value, lowest priced baler in N.Z.

South Island Distributors:

ANDREWS & BEAVEN LTD.

Moorhouse Avenue, Christchurch. And at Invercargill, Timaru, and Ashburton. Agents: Levin & Co. Ltd., Nelson. W. G. G. Cuddon Ltd., Blenheim. Ernest Reid & Co. Ltd., Oamaru. Donald Reid & Co. Ltd., Dunedin. West Coast Agencies, Greymouth.

Rolled bales are weatherproof—stack easily—retain their full feeding value. Roll Baler handles up to 8 tons of good, first-cutting hay per hour (depending on size of windrow).

Ask for prices and details from your nearest Allis Chalmers Agents.

ALLIS CHALMERS

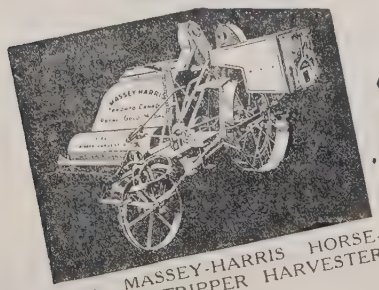
ROLL BALER

North Island Distributors:

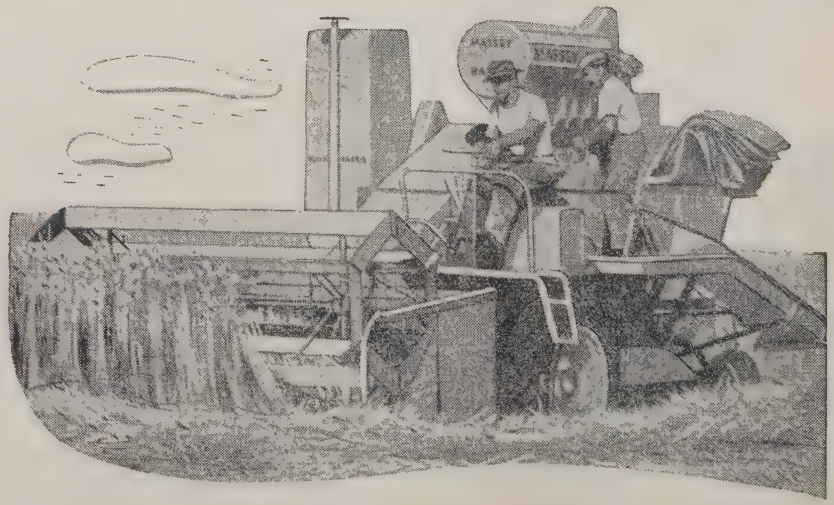
LEVIN & Co. Ltd.

Agents: Levin & Co. Ltd., Box 1496, Wellington. Levin & Co. Ltd., Box 63, Auckland. Levin & Co. Ltd., Box 28, Feilding. Levin & Co. Ltd., Box 591, Hastings. Levin & Co. Ltd., Box 56, Masterton. Levin & Co. Ltd., Box 69, Wanganui. Messrs. F. Butler Ltd., Box 534, Hamilton; also Rotorua. Messrs. J. B. MacEwan & Co. Ltd., Box 114, New Plymouth. Levin & Co. Ltd., Pahiatua. Messrs. Campbell McLean Ltd., Ngatea. Messrs. Wilson & Coombes, Te Aroha.

LEADERS FOR 50 YEARS!



1901 MASSEY-HARRIS HORSE-DRAWN STRIPPER HARVESTER



Made better by
MASSEY-HARRIS
— so make it a

MODEL 726 MASSEY-HARRIS

Self-Propelled COMBINE

Engineered from the ground up, the 726 Combine Harvester is outstandingly efficient for *every* harvesting condition. A single rugged motor propels the 726 and powers *all* the working parts.

Balanced separation ensures front end can take it, rear end can handle it with minimum loss—auger table and electric lift—8½ft. cut—the 726 gets *all* your crop quickly and profitably.

From Standing Crop to Bagged Grain — ONE OPERATION.

MASSEY-HARRIS CO. LTD.

Head Office: CHRISTCHURCH. *Branches:* AUCKLAND, PALMERSTON NORTH and DUNEDIN. Agencies everywhere.

(P. & D. Duncan Implements are sold exclusively by Massey-Harris Co. Ltd.)

Certified perennial ryegrass lines are dressed. In view of the high proportion of the total seeds dressed which are certified it may fairly be said that all dressing firms now keep the rules of certification in mind when they are cleaning the seed. The result is that there is every co-operation between the seed-dressing firms and the officers of the Extension Division of the Department of Agriculture, which makes for easier working on both sides.

Extent of Seed Cleaning in New Zealand

Seed-dressing stores are usually stationed at all the centres of seed-growing areas. The number at any one centre may vary from a single plant to half a dozen or more. Of the 87 plants in operation 64 are in the South Island and 23 in the North Island. In addition 16 mobile or portable seed-cleaning outfits work from farm to farm in the main seed-growing areas of the South Island dressing grain and small seeds.

The Human Element

The quality of the work done by seed-cleaning machinery depends finally on one thing—the efficiency of the men operating the machines. An experienced storeman with the ability to sum up a line and gauge what will be required in the dressing process is the first essential. Then the men in charge of each machine require long experience in the handling of their machines, in the adjustment of riddles and cylinders, and in the degree of blast or suction to apply as well as in the choice of the correct size of riddle or cylinder for the seed in question. Due to the great variation in the composition of field-dressed seed, no two lines can be treated exactly alike. This calls for good judgment on the part of operators.

It is not only in the operation of the machines that good judgment is required; ability to repair machinery and make up and improve suitable parts on the job is another requirement of a good storeman. Again, the way in which machines are set up, that is, the combination of riddles, cylinders, etc., and the part played by machines such as the dossor, all call for good judgment on the part of the storeman. The very high standard generally of the work done in seed-dressing stores shows that the men responsible are doing an excellent job.

The Farmers' Part

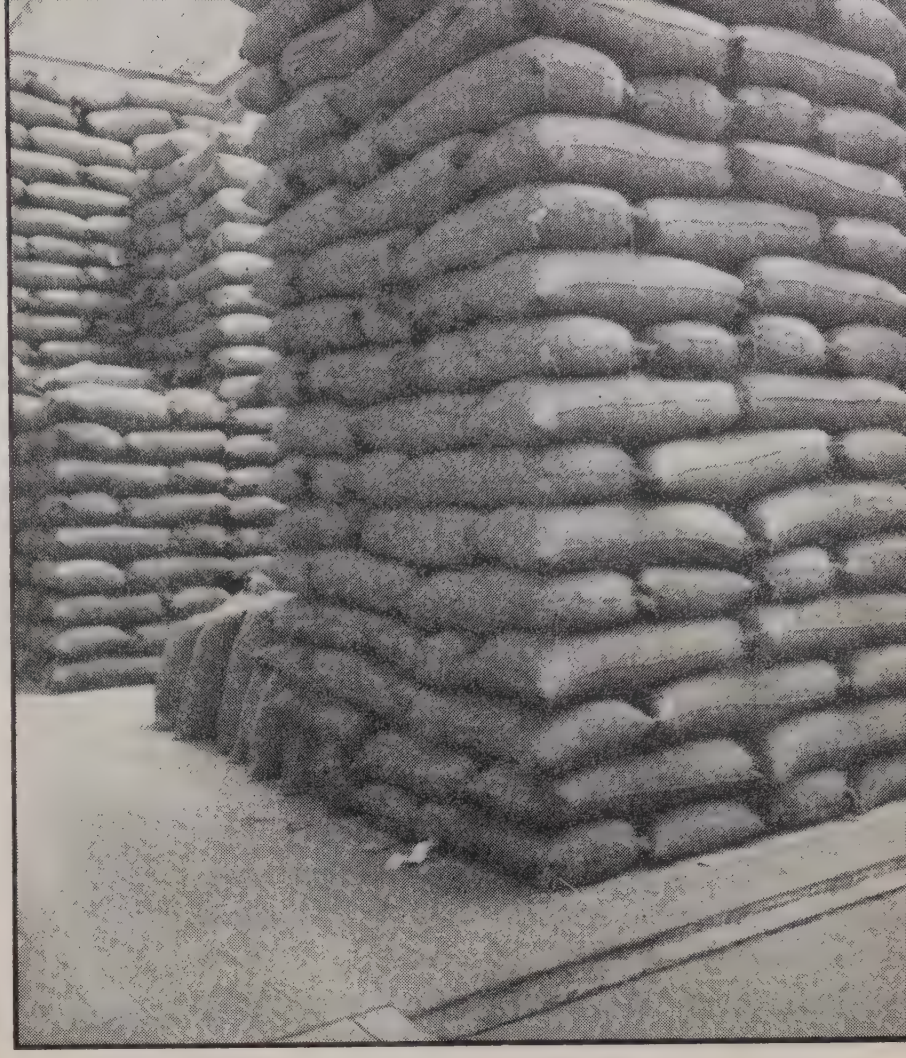
This article has been concerned mainly with the work of actual machine dressing and not with the harvesting and other farm operations leading up to the production of the field-dressed seed. This aspect has been dealt with in the articles which have appeared in the "Journal" on the production of each of the main varieties of seed. However, it is not out of place to mention some of the principal ways in which a farmer may make the work of the seed cleaner easier and in so doing improve the quality of his own line and reduce the cost of dressing to himself.

In the first place the advice of a leading member of the seed-cleaning industry is sound: "Leave the seed as much as possible as nature produces it". That is, it is never wise to thresh too hard and possibly knock the awns off seeds such as goosegrass, hairgrass, or Italian ryegrass, or damage and chip clover seed in trying to get it out of the cob. Seed that has been knocked about, whether it is the impurity or the actual variety to be dressed, is all the harder to dress. This applies to all seeds. On the other hand too much straw and seed stalk should not be left in the sample, as this merely increases dressing costs needlessly.

Sometimes seed comes into store badly damaged, due probably to ignorance of correct harvesting technique. The only advice that can be offered in such cases is to follow carefully at harvest time the instructions of the manufacturer of the header harvester and to seek advice if in doubt. At harvest time the farmer should keep sampling and examining the seed at intervals throughout the day, as changing atmospheric conditions may affect considerably the necessary header harvester settings.

Before seed is sent in to be cleaned it should be thoroughly dry. Damp seed is only a nuisance in store, as it is difficult to dress. It is also lowered in value because of discoloration and musty smell and it may even heat or char in store. Where merchants are aware of the fact that the seed is damp and are prepared to deal with it as a salvage operation, of course that is a matter for the farmer and the firm concerned. Whatever the cause, no seed should be sent into store damp unless the merchant is aware of the fact and is prepared to deal with it.

The production of good seed starts from the preparation and sowing of a paddock. Everything possible should be done to keep the paddock clean by sowing under the best conditions, by grazing the paddock in the way best suited for the seed to be saved and for control of weeds, and by harvesting the seed in the best manner. In other words, clean seed production should be regarded as a specialised job under good farm management conditions in order that the end product, the machine-dressed seed, might be of the highest quality.



The final product: Stacks of machine-dressed seed awaiting shipment or disposal through other means.

ACKNOWLEDGMENTS

The writer wishes to acknowledge with thanks the help and information provided (and used in the compilation of this article) by Andrews and Beaven Ltd., Wright Stephenson and Co. Ltd., and the Canterbury (N.Z.) Seed Co. Ltd., all of Christchurch.

Care of Livestock during February

Contributed by the Animal Research Division

PREPARATIONS FOR TUPPING

IF the ewes have been held on short pasture since weaning, they should now be in good hard condition. About 14 days before tupping they should be crutched and given the best pasture available. This will ensure that they are rising in condition at the time of mating, which is one of the most important factors in providing a good lambing percentage. Rams, too, should be crutched and flushed for about 3 weeks before tupping. They should be dipped before this flushing period, as dipping too close to tupping appears to reduce ram fertility.

COBALT DEFICIENCY

Bush sickness can be prevented completely by topdressing annually with cobaltised superphosphate, and in the North Island at least this is best applied in the usual autumn topdressing. Cobaltised superphosphate prepared in North Island works contains 3lb. of cobalt sulphate per ton; 2cwt. of this fertiliser contains sufficient cobalt for 1 acre. In the South Island cobaltised superphosphate contains 6lb. of cobalt sulphate per ton, and 1cwt. of this fertiliser per acre contains sufficient cobalt. If greater quantities of fertiliser than those indicated are used, the additional amount need not be cobaltised. For fuller details consult the Department of Agriculture's Bulletin No. 180.

SOWS AND WEANERS

Sows which are to be remated should receive 6 gallons of milk per day for the first month after the litters are weaned. This will greatly facilitate getting them in pig. Weaners should be fed up to 1lb. of meal per day, as fast growth in the earlier stages means heavier pigs when the milk supply fails. Pens showing deterioration of pasture should be harrowed and surface sown or ploughed in preparation for a crop.

FACIAL ECZEMA

If warm rains fall in February after a spell of hot, dry weather, facial eczema is likely to occur in districts which are usually affected. Experience during recent years has shown conclusively that the disease can be prevented by shutting sheep up at the rate of at least 100 to the acre as soon as the rains fall, and keeping them so confined until the weather becomes either hot and dry or much cooler and the pasture visibly hardens. If dry periods occur, plans should be made for action along these lines: Good hay at the rate of 2lb. per sheep per day will prevent loss of condition. If crops of rape, kale, turnips, or chou moellier are available, they can be grazed safely during the dangerous period. The grazing of such crops is the only satisfactory way of preventing the disease in lambs, which react badly to restricted grazing. Lucerne has not proved safe, possibly because of ryegrass, which is frequently present as a weed.

PULLORUM DISEASE IN POULTRY

Preparations should be made now for the autumn hatch by blood testing the poultry flock for pullorum disease and by cleaning and fumigating the incubators. A vacuum cleaner is ideal for the cleaning work, and advice on fumigation may be obtained from the local Poultry Instructor.

COWS RETURNING TO THE BULL

If several cows return to the bull at long, irregular intervals and some abort early in pregnancy (2 to 8 months), trichomoniasis may be the cause, and veterinary advice should be sought. There are many different reasons, apart from trichomoniasis, for cows failing to get in calf at the desired time. Any one reason or a combination of causes can result in herd infertility, which may be impossible to correct during the short mating period. A diagnosis now will help in preventing similar trouble next season.

CARE OF CALVES

Autumn is a critical period for calves. Deaths during winter can be eliminated by rotating the calves through the paddocks ahead of the cows at intervals of 3 or 4 days. If this is not being done, it should be begun immediately. Calves treated in such a way will be up to 100lb. heavier as yearlings than those kept confined in a calf paddock. If calves are unthrifty and scouring, it may be necessary to give 2 or 3 doses of phenothiazine at 3-weekly intervals, but this is seldom necessary with calves which are rotationally grazed.

COPPER DEFICIENCY

Scouring in cattle and staggering in lambs grazing on peat land can be prevented by topdressing the pastures in autumn with 5lb. of bluestone per acre. Copperised superphosphate is now available or the bluestone may be mixed with lime. For fuller particulars the Department of Agriculture's Bulletin No. 238 should be consulted.

Dairy Produce Graded for Export

THE following figures showing quantities of dairy produce graded for export during November and for the 4-months ended 30 November 1951, with comparative figures for the same month and 4-monthly period of 1950, have been compiled by the Dairy Division of the Department of Agriculture from figures supplied by divisional officers at the various grading ports:—

BUTTER

Period	Creamery	Tons Whey	Total	% Inc. or dec.	Total tons In store at end of mth.
November 1951 ..	23,531	401	23,932	—	19,113
November 1950 ..	21,949	410	22,359	—	32,713
Inc. or dec. ..	+1,582	—9	+1,573	+7.035	—13,600
For 4 mths. to 30/11/51 ..	67,993	1,114	69,107	—	—
For 4 mths. to 30/11/50 ..	65,885	1,196	67,081	—	—
Inc. or dec. ..	+2,108	—82	+2,026	+3.311	—

CHEESE

Period	White	Tons Coloured	Total	% Inc. or dec.	Total tons In store at end of mth.
November 1951 ..	13,749	46	13,795	—	13,340
November 1950 ..	14,972	22	14,994	—	20,687
Inc. or dec. ..	—1,223	+24	—1,199	—7.996	—7,347
For 4 mths. to 30/11/51 ..	33,164	56	33,220	—	—
For 4 mths. to 30/11/50 ..	35,673	1,245	36,918	—	—
Inc. or dec. ..	—2,509	—1,189	—3,698	—10.016	—

If these figures are converted into butterfat equivalent, there is an increase of 0.443 per cent. in butterfat graded for the 4 months as compared with the corresponding period of the preceding season. It should be noted that the above figures refer only to butter and cheese graded for export, and that owing to diversions which may take place from time to time, they are not necessarily a true indication of production trends.

Crop and Pasture Production

Seasonal Notes by the Extension Division

PREPARATORY work for next season's crops should follow closely on this season's harvest and, as early as weather conditions allow, attention should be given to seed-bed preparation for autumn grass and autumn- and winter-sown cereals.

* * *

WHEAT AND OATS

THE best method of preparing a grass paddock for wheat is to skim plough it during the summer or early autumn. The furrow slices should then be rolled and left for the turf to rot. Once the turf has disintegrated the land should be disced and then deep ploughed. Subsequent cultivation should aim at a seed-bed which is fine underneath but cloddy on top. When wheat follows rape only one ploughing is necessary and a stroke of the harrows after ploughing is usually sufficient to prepare a suitable seed-bed. Drilling of oats after wheat is common on heavy land, and as soon as the wheat is harvested the land should be ploughed, grubbed, and harrowed, and the oats drilled in April or May.

* * *

PASTURE SEED-BED

AN important factor in the establishment of autumn-sown pastures is consolidation. Both over-consolidation and under-consolidation may result in the money spent on seed and fertiliser being wasted through poor establishment. Over-consolidation of the surface of clay soils by excessive rolling frequently leads to cracking and drying out with consequent death of seedlings. Time is the most important factor in consolidating heavy soils; hence the advantage of a summer fallow. Under-consolidation is very common on light, free-working soils. With a loose seed-bed the initial germination of grasses is often satisfactory, but the clovers do not germinate until late in the season, with the result that the grasses are starved for nitrogen and die. Rolling on the furrow should always be the first step in working down light land.

TIME OF SOWING

Early sowing of autumn-sown pastures is desirable for two reasons. First, it gives the grasses and clovers a better chance to establish before the cold weather starts. Second, it enables the pasture to establish and produce winter feed much better than will a late sowing. Early sowing is of particular importance where Italian or short-rotation ryegrass is included in the mixtures.

* * *

IRRIGATED PASTURES

ON the Canterbury irrigation schemes, on a light, stony silt loam, the best irrigation frequency appears to be every 3 weeks. Grass responds to irrigation at all stages of growth and pasture establishment can be assured by irrigating the land before sowing and making the maximum use of irrigation water during the first year. Recent experimental work has shown that the light Canterbury soils under irrigation will carry up to 9 ewes and their lambs per acre. Though this concentration of ewes may not be the best method of exploiting the grass, it illustrates the potential production of the land. Surplus feed above the requirements of the normal level of 5 ewes per acre can be used for hay, for seed, or for fattening store lambs and cattle.

AUTUMN-SAVED PASTURE

With autumn irrigation fields in Canterbury can be closed early in March with an assurance that sufficient growth can be produced for early-spring use by ewes and lambs. The aim should be to close at least 5 acres per 100 ewes, for ewes will winter well on hay and autumn-saved grass.

* * *

Young pasture on scrub land. Note vigorous clover establishment on tractor wheel marks.

WHEAT-STRAW STUBBLE

WITH the advent of the header harvester a problem has been created in the disposal of wheat stubbles. There are several alternative methods, but the best to adopt depends on the crop rotation. If the crop has been oversown with a pasture mixture in spring, it is advisable to head the crop as high as possible and then cut and bale the straw. However, if the crop is very light, it may be possible to head it low and leave the stubble to be picked at and trampled by stock without harming the pasture.

BURNING

Should the crop be followed by an autumn-sown crop such as wheat, greenfeed, or oats and lupins for winter feed, it is advisable to burn the stubble. If the following crop is wheat, burning will reduce the risk of hessian fly and fungous diseases which normally increase in a second crop. Burning will destroy some weed seeds and accelerate the germination of others, and a kill by cultivation can be carried out. Nitrogen starvation, which may occur in a dry season, when straw is ploughed under, will be avoided by burning. This starvation is caused by the soil nitro-organisms using the available soil nitrogen while converting the ploughed in straw to humus. Some organic matter is lost when stubble is burnt, but the loss is very slight.

PLOUGHING UNDER

If the crop is to be followed by a spring-sown crop such as oats, barley, peas, rape, or turnips, the straw need not be burnt. By late autumn or winter, when the cultivation work on the paddock begins, the straw will be fairly well broken down by weather and stock. Also, weed and stubble clover growth may be quite considerable, and this, when ploughed in with the straw, will help in the decay.

GREENFEED CEREALS

CEREAL greenfeeds are commonly grown after a grain crop. Seed-bed preparation should begin immediately the preceding crop is harvested. Burn off the straw and disc immediately after burning. Sowing should take place immediately the soil is moist enough for seed germination. Cereal varieties suitable for greenfeed production are Algerian and Dun oats, Cape, Wong, and Black Skinless barley, and N.I.A.B. ryecorn. On light and medium cropping land the inclusion of lupins (1 bushel of lupins and 1 bushel of cereal) is a good way of building up soil fertility and at the same time improving the quality of the feed.

Brown Rot of Stone Fruit

BROWN rot (*Sclerotinia fructicola* (Wint.) Rehm.) is still, after many years of research both in New Zealand and overseas, the most serious disease of stone fruit with which the fruit grower has to contend. The disease infects peaches, plums, nectarines, cherries, and apricots and is common throughout New Zealand. This article by H. A. Prew, Orchard Instructor, Department of Agriculture, Auckland, gives recommendations on control measures. By following the advice given growers will be assisted in their efforts to minimise losses from brown rot.

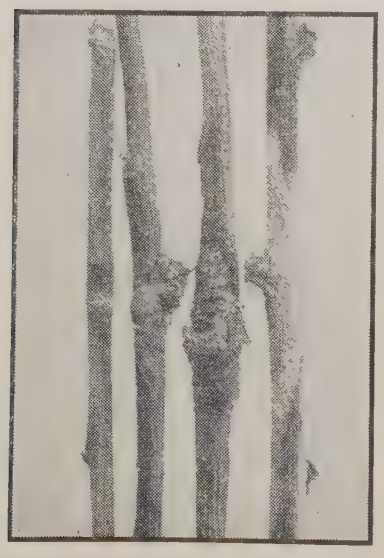
BROWN rot often may appear first on the blossom, and at this stage it is commonly referred to as blossom rot. During periods of hot humid weather, particularly, it is common for a large proportion of the blossoms to be infected and killed.

Infection may take place at any time after the blossom buds begin to show colour up to about the petal-fall stage of development. There are usually two distinct phases of infection with little obvious increase during the intervening period unless conditions are exceptionally favourable. The first phase occurs round blossoming time and the second just before the fruit reaches maturity.

Infected blossoms are killed and turn brown, and gum may exude from the flower stalk, causing the dead petals to adhere to the laterals for as long as a month after normal petal fall. Leaf buds, too, may become infected, and in this case the fungus may travel along the lateral to the blossom. A small canker or dead area is usually formed at the point of entry of the disease.

Infection of the growing fruit can follow blossom infection and it is not uncommon when the plum variety Wilson's Early is attacked for about one half of the crop to become infected by the time the fruits are half grown.

The fungus can travel down from infected laterals and kill fruiting arms or even large leaders. When this occurs gumming and numerous cankers are conspicuous. Once the bark has been killed round any fruiting arm or leader the leaves above that point wilt, turn brown, and die.



Brown rot damage to peach laterals.

Persistence of Disease

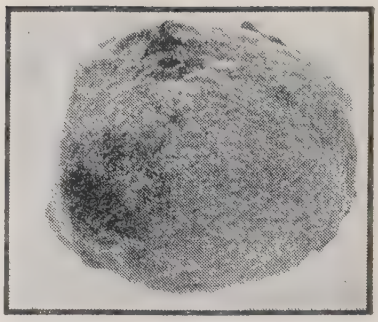
Foliage killed in this way may adhere to the laterals for many weeks. The cankers that are formed on the laterals and fruiting arms are sources of infection and are one of the ways in which the disease carries over from year to year.

Soon after a fruit becomes infected the fungus threads grow to the surface and produce large numbers of spores (minute seed-like bodies) which are carried a considerable distance by the wind. Under warm and humid weather conditions any which alight on fruit or other susceptible tree parts soon germinate and set up further infection. Many infected fruits may remain on the trees for months, even until the following season, gradually becoming dry and shrivelled, and being known as "mummies". While on the tree they continue to produce spores; when they fall to the ground and become covered the fungus concentrates into small, hard, irregular resting bodies, or sclerotia. These may remain viable for years. If they are not buried too deeply, in spring they will send up stalks bearing cup-shaped apothecia inside which is produced a special type of spore (ascospores). These very often infect the opening blossoms and so renew the cycle of infection.

Control Methods

In many parts of New Zealand it is not possible to secure a satisfactory control of brown rot by spraying alone and it therefore becomes necessary to practise rigid orchard hygiene. Strict attention to the following points is believed to be a worthwhile contribution to brown rot control.

1. Prune out and burn all infected wood with all prunings from affected trees. Where the climate is humid it is desirable that the annual wood growth, particularly of peaches and nectarines, be thinned out in winter and also if possible in summer to allow free circulation of air throughout the tree.
2. Burn or bury deeply all mummified fruit, burning being preferable. Cultivation in the spring before blossoming will help to destroy any apothecia which may have been formed on the mummies that fell to the ground during the fruit season.
3. Thin fruits at early fruit-set stage of development, so that when they are fully matured few fruits will touch each other.
4. Examine trees frequently and remove and destroy all infected fruits.
5. Keep the packing shed as free from infected fruit as is practicable.



The "mummy", with the fruiting body well developed.

6. Handle fruit for market with the utmost care to prevent injury. Fruit with skin punctures should be eliminated. Picking tins and boxes can be lined with a layer of woodwool to prevent damage.
7. Fruit, particularly peaches, that will be in transit overnight should if practicable be wrapped to reduce the risk of infection spreading within the container.
8. Spray all host trees thoroughly according to the following programme:—

Period of application	Treatment
Bud movement of leaf buds ..	Bordeaux mixture 5 : 4 : 50
*Late pink	Lime sulphur 1 : 100
Petal fall	
One month after petal fall	Lime sulphur 1 : 150 plus colloidal sulphur (40 per cent.) 2lb. to 100 gallons of spray
Seven weeks after petal fall	
Five weeks before first picking	
Three to 2 weeks later	
Leaf fall	Bordeaux mixture 5 : 4 : 50

* This spraying is important only in districts where blossom infection by brown rot is liable to be severe.

Treatment for Apricots

Apricots are susceptible to sulphur damage and the following spray programme with Bordeaux mixture is suggested:—

Period of application	Treatment
Bud movement ..	5 : 4 : 50
Petal fall	3 : 4 : 50
At monthly intervals	1 : 1½ : 50 to 1½ : 3 : 50
Beginning of leaf fall	5 : 4 : 50

Making of Bordeaux Mixture

Quantities required to make 4 gallons of the different strengths of Bordeaux mixture are as follows:—

For 5 : 4 : 50 use 6½oz. of powdered bluestone and 5¼oz. of hydrated lime; for 3 : 4 : 50 use 4oz. of bluestone and 5¼oz. of hydrated lime; for 1½ : 3 : 50 use 2oz. of bluestone and 4oz. of hydrated lime; and for 1 : 1½ : 50 use 1½oz. of bluestone and 2oz. of hydrated lime.

Dissolve the powdered bluestone in 3½ gallons of water. In a separate container place the hydrated lime and mix it to a thin paste with ½ gallon of cold water. While stirring the bluestone solution, slowly add the lime water. The mixture is then ready for use.

Reference: "Fungous Diseases of Fruit Trees", by G. H. Cunningham.

Lambing Estimates for 1951 Season

In the following lambing estimates for the 1951 season, contributed by the Livestock Division, it was necessary to use 1950 breeding ewe figures. Because of the holding back of breeding stock last season the lamb crop for 1951 is likely to be higher than estimated below.

AUCKLAND DISTRICT

County	Breeding ewes (as at 1950)	Estimated percentage of lambs	Estimated number of lambs
Mangonui	29,063	86.6	25,169
Whangaroa	14,165	83.0	11,757
Bay of Islands	60,278	92.0	55,456
Hokianga	40,974	83.3	34,131
Whangarei	90,335	84.1	75,972
Otamatea	80,253	95.1	76,321
Hobson	78,849	88.2	69,545
Rodney	90,601	84.4	76,467
Great Barrier	5,920	63.9	3,783
Waitemata	72,283	92.6	66,934
Eden	3,117	91.1	2,840
Manukau	70,961	88.4	62,730
Franklin	140,084	96.8	135,601
Coromandel	30,767	72.0	22,152
Thames	13,153	83.3	10,956
Hauraki Plains	19,077	96.7	18,447
Ohinemuri	21,867	89.0	19,462
Waikato	171,554	100.3	172,069
Raglan	449,148	89.3	401,089
Waipa	184,277	100.3	184,830
Piako	136,508	99.0	135,143
Matamata	300,345	98.9	297,041
Rotorua	110,524	96.5	106,656
Taupo	18,437	95.6	17,626
Taumarunui	114,862	86.8	99,700
Kawhia	73,213	86.9	63,622
Otorohanga	154,411	98.3	151,786
Waitomo	381,165	86.2	328,564
Ohura	117,513	95.1	111,755
Kaitieke	65,293	88.6	57,850
Tauranga	149,069	97.2	144,895
Whakatane	51,065	89.2	45,550
Opotiki	46,469	80.7	37,500
Totals	3,385,600	92.26	3,123,399

WELLINGTON-WEST COAST-WAIRARAPA DISTRICT

County	Breeding ewes (as at 1950)	Estimated percentage of lambs	Estimated number of lambs
Clifton	92,653	97.3	90,151
Taranaki	29,295	97.3	28,504
Inglewood	53,022	97.7	51,802
Egmont	21,938	103.8	22,772
Stratford	113,281	93.5	105,918
Whangamomona	56,178	87.3	49,043
Eltham	55,255	101.6	56,139
Hawera	78,349	100.6	78,819
Waimate West	4,996	105.3	5,261
Patea	215,027	98.7	212,232
Waitotara	137,093	94.7	129,827
Waimarino	176,546	93.0	164,188
Wanganui	269,255	90.2	242,868
Rangitikei	974,058	91.0	886,393
Oroua	213,629	105.0	224,310
Kairanga	111,545	100.0	111,545
Kiwitea	248,269	99.6	247,276
Pohangina	132,897	97.2	129,176
Manawatu	147,794	100.0	147,794
Horowhenua	122,074	94.9	115,848
Hutt	67,564	83.3	56,281
Makara	45,601	88.3	40,266
Featherston	321,425	96.8	311,139
Wairarapa South	168,858	90.6	152,985
Masterton	292,858	83.4	244,244
Castlepoint	85,735	90.4	77,504
Eketahuna	136,837	89.3	122,195
Mauriceville	46,693	89.6	41,837
Totals	4,418,725	93.84	4,146,317

GISBORNE-HAWKES BAY DISTRICT

County	Breeding ewes (as at 1950)	Estimated percentage of lambs	Estimated number of lambs
Matakaoa	63,450	82.0	52,029
Waiapu	236,283	80.2	189,499
Uawa	120,706	82.1	99,100
Cook	420,263	85.4	358,905
Waikohu	350,050	86.3	302,093
Wairoa	410,271	84.1	345,038
Hawkes Bay	929,391	93.5	868,981
Waipawa	451,405	100.0	451,405
Waipukurau	143,012	95.6	136,719
Patangata	504,202	92.0	463,866
Weber	54,820	93.5	51,257
Dannevirke	292,606	91.1	266,564
Woodville	88,221	95.1	83,898
Pahiatua	161,474	94.1	151,947
Akitio	151,318	86.2	130,436
Totals	4,377,472	90.27	3,951,737

MARLBOROUGH-NELSON-WESTLAND DISTRICT

County	Breeding ewes (as at 1950)	Estimated percentage of lambs	Estimated number of lambs
Waimea	163,842	86.7	142,051
Takaka	27,156	82.0	22,268
Collingwood	13,126	80.0	10,501
Buller	1,348	86.1	1,161
Inangahua	13,179	96.1	12,665
Murchison	27,673	79.2	21,917
Grey	24,580	111.3	27,358
Westland	32,055	111.0	35,581
Sounds	92,945	74.0	68,779
Marlborough	202,589	87.0	176,252
Awatere	167,776	92.0	154,354
Totals	766,269	87.81	672,887

CANTERBURY-KAIKOURA DISTRICT

County	Breeding ewes (as at 1950)	Estimated percentage of lambs	Estimated number of lambs
Kaikoura	126,350	93.0	117,506
Amuri	217,387	86.7	188,475
Cheviot	150,183	100.3	150,634
Waipara	287,088	101.5	291,394
Ashley	64,280	99.3	63,830
Kowai	76,598	112.6	86,249
Oxford	67,907	87.9	59,690
Rangiora	47,262	110.5	52,225
Eyre	56,405	106.8	60,241
Tawera	50,565	79.9	40,401
Malvern	132,998	103.6	137,786
Paparua	35,125	111.7	39,235
Waimairi	2,794	102.0	2,850
Heathcote	6,936	93.1	6,457
Akaroa	82,606	110.0	90,867
Mount Herbert	38,359	105.0	40,277
Wairewa	67,849	103.0	69,884
Halswell	14,899	101.0	15,048
Springs	30,130	114.0	34,348
Ellesmere	75,179	118.0	88,711
Selwyn	140,266	71.7	100,571
Ashburton	780,784	91.2	712,075
Geraldine	261,603	95.4	249,569
Levels	186,612	116.3	217,030
Mackenzie	298,835	86.0	256,998
Waimate	487,624	92.3	450,077
Chatham Islands	45,348	73.0	33,104
Totals	3,831,972	95.40	3,655,532

OTAGO DISTRICT

County	Breeding ewes (as at 1950)	Estimated percentage of lambs	Estimated number of lambs
Waitaki	449,279	98.0	440,293
Maniototo	226,278	95.0	214,964
Vincent	238,526	91.0	217,059
Waihemo	100,560	100.0	100,560
Waikouaiti	71,997	98.0	70,557
Taieri	171,256	91.0	155,843
Peninsula	15,362	101.0	15,516
Clutha	471,664	101.0	476,381
Tuapeka	353,291	93.0	328,561
Bruce	252,279	98.0	247,233
Lake	128,579	80.0	102,863
Southland	1,980,797	108.0	2,139,261
Wallace	639,282	98.0	626,496
Stewart Island ..	2,279	80.0	1,823
Totals	5,101,429	100.71	5,137,410

DISTRICT ESTIMATES

Auckland	3,385,600	92.26	3,123,399
Gisborne - Hawkes Bay	4,377,472	90.27	3,951,737
Wellington - West Coast-Wairarapa	4,418,725	93.84	4,146,317
Marlborough - Nelson-Westland .	766,269	87.81	672,887
Canterbury-Kaikoura	3,831,972	95.40	3,655,532
Otago	5,101,429	100.71	5,137,410
Dominion ..	21,881,467	94.54	20,687,282

Dominion Totals

The following table shows the estimated lambing for the North and South Islands for the previous 5 years together with the actual number of lambs tailed:—

Year	Number of breeding ewes (*as at 1950) (†as at 1945)	Estimated percentage of lambs	Estimated number of lambs	Actual No. of lambs tailed
NORTH ISLAND				
1951 ..	*12,181,797	92.12	11,221,453	—
1950 ..	12,181,797	94.04	11,454,372	Not available
1949 ..	12,027,414	94.55	11,371,834	11,702,479
1948 ..	11,821,596	89.43	10,572,444	10,830,868
1947 ..	11,696,313	92.47	10,814,554	11,250,554
1946 ..	†11,890,011	87.92	10,453,719	10,447,857
SOUTH ISLAND				
1951 ..	*9,699,670	97.59	9,465,829	—
1950 ..	9,699,670	97.65	9,471,747	Not available
1949 ..	9,472,289	98.93	9,370,665	9,467,367
1948 ..	9,233,886	96.93	8,950,202	8,975,017
1947 ..	9,047,469	93.94	8,498,971	8,584,492
1946 ..	†8,975,847	91.69	8,229,713	8,194,441
DOMINION				
1951 ..	*21,881,467	94.54	20,687,282	—
1950 ..	21,881,467	95.64	20,926,119	Not available
1949 ..	21,499,703	96.48	20,742,499	21,169,846
1948 ..	21,055,482	92.72	19,522,646	19,805,885
1947 ..	20,743,782	93.11	19,313,525	19,835,046
1946 ..	†20,865,858	89.54	18,683,432	18,642,298

Methods of Attaching Chain on Plough for Burying Growth

WHEN land covered with high growth such as broom, gorse, lupin, manuka, or tall rushes is to be ploughed clearing and burning before ploughing can be avoided if a heavy swamp plough with high clearance is used and a heavy chain is attached to the plough to drag the growth under the furrow slice.

FOR satisfactory work one end of the chain should be attached to the beam of the plough just in front of the leg which holds the mouldboard, while the other end should be attached as low as possible to the stock holding the front furrow wheel. The chain should be long enough to form a loop which will just clear the bottom of the mouldboard when the plough is running empty.

When the plough is in operation the loop formed by the chain gathers in all high growth and drags it under the furrow. To work efficiently it is important that the chain be attached as low as possible to the front stock of the plough, as shown in the illustration on the left below.

When the scrub has been cut or burnt off before ploughing is done the remaining rubbish tends to be broken when the tractor moves over it, and it will give trouble by dragging if the chain is looped. Under these conditions the chain works better if one end is attached to the beam of the plough in front of the leg and is allowed to drag straight back under the furrow. When attached in this position the chain gathers the loose rubbish under the furrow quite satisfactorily, as shown in the illustration on the right below.

—E. B. GLANVILLE,
Farm Superintendent,
Department of Agriculture,
Wellington

Buckrake as Aid in Silage Making

By D. F. SCOTT, Machinery Instructor, Department of Agriculture, Auckland

THE buckrake, which is really a type of hydraulically operated sweep mounted on the rear of a tractor, offers a way of making silage that is fast, requires less labour, and can be employed with trenches, with rectangular clamps either on flat or sloping land, or with the low, bun-shaped stack. The fact that the buckrake enables one man to make silage without assistance should make it popular with the small dairy farmer who hitherto has either not made silage or has had to work many days away from his own farm to repay borrowed labour.

Buckrake in the sweeping or picking up position. Material can be picked up by running along or across the swath or from heaps made with a sweep.

THE buckrake can be used only on tractors fitted with hydraulic lift equipment, but it can be quickly and easily fitted to any of the new tractors which use 3-point mounting for their implements.

The principle of operation of the buckrake depends on its three positions, those for sweeping, carrying, and dumping.

In sweeping the hydraulic lift is lowered so that the tines of the rake are nearly parallel to the ground surface. In this position the tractor is backed either across or along the swath until a load is obtained, when the hydraulic lift is raised and the rake is in the carrying position.

In the carrying position the tines are raised so that they are well clear of the ground and are inclined upward to prevent grass dropping off during travel.

As the tractor passes through the trench or arrives at the point on the stack where the load is to be dropped the driver pulls the trip lever and drops the points of the tines, which puts the rake in the dumping position. The tractor continues on its way, the driver lowers the hydraulic lift, the trip catch re-engages, and the lift is raised again to travel out to the newly mown material.

When a buckrake is used for making silage in a trench or clamp it is advisable to have the trench or clamp about twice as wide as the rake. This gives enough room for the wheels of the tractor to consolidate the stack right across without leaving a narrow strip down the centre.

Safety Precautions

Where the buckrake is being used to carry silage up a stack or clamp there will be a tendency as soon as the climb becomes steep for the front of the tractor to rise due to the weight on the rear. This rising can be prevented to some extent by adding weight to the front of the tractor, but the lifting danger still exists and the safest way to avoid it is to back the tractor up the stack. Although it may be considered that the buckrake will prevent the tractor from tipping over backward, it does not prevent the tractor from lifting to a point where it can easily topple sideways.

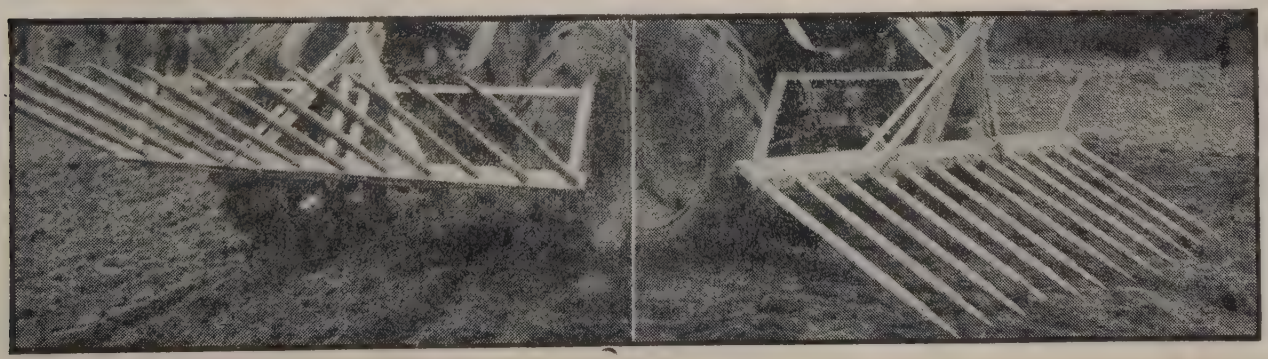
Using the Buckrake

One buckrake can work efficiently on carrying distances up to ¼ mile, but on longer distances it is preferable to use either 2 buckrakes or a buckrake and a sweep. The sweep can be used to sweep the material up into small heaps for the buckrake to collect. Sometimes there is trouble in getting the material to slide on to the tines. It is then worth trying to vary the slope on the tines and to increase the downward pressure on their points so that they will slide under the cut grass. It has sometimes been necessary to remove paint from tines and to polish them with a wire brush before the rake would work satisfactorily.

Because of the excellent consolidation obtained with the buckrake, silage that is put in too quickly may become sour because of lack of heating, so care should be taken to see that too much is not put into a trench or clamp at one time and that the silage is allowed to heat before more is put on. Particular care should be taken with young material at the bottom of a trench. Old material will benefit from the extra consolidation.

Covering of Silage

Experience shows that it is not necessary to cover the trench or clamp with earth if the material used for the silage is fairly young and succulent. The consolidation obtained when making the silage and subsequent running over the top of the trench or clamp with the tractor for a short time daily for about a week after silage making has finished forms a thin skin of pulverised silage which excludes air and keeps waste to a minimum.



Buckrake in carrying position (left) and dumping position (right).

Infra-red Lamps for Brooding Chicks on Poultry Farms

INFRA-RED lamps to supply heat for brooding chicks have been available in New Zealand for about 2 years. This method of brooding has been studied carefully in the field by Poultry Instructors and at the same time has been used at the Department of Agriculture's Poultry Demonstration Plant at Upper Hutt. In this article F. C. Bobby, Superintendent, Poultry Industry, Wellington, reviews the findings of officers in the field and comments on the results at Upper Hutt.

BROODING methods in general have remained unaltered in New Zealand since the introduction of canopy brooders containing varying types of electric heating units, except that the chick battery brooder has found favour with a limited number of commercial poultry producers. Therefore the amount of interest shown almost immediately the infra-red lamps were introduced for brooding was surprising. Field officers have reported farmers of many years' experience changing to this method, including some whose brooding results in the past have been of a very high standard, and this change was made before any really exhaustive test had been made with the lamps in New Zealand.

Information from overseas about infra-red lamps is still coming to hand and has been distinctly baffling, as the results appear to have varied considerably, some being in favour of the lamps and others either non-committal or unimpressive.

For infra-red lamps to replace present brooding equipment they must satisfy one or more of the following requisites: They must produce better chicks, they must be cheaper to run, or they must be easier to run or call for less skilled attention.

When these lamps were first offered for sale the Department of Agriculture recognised that they might well have a marked value for chick rearing. It was felt that they might rear better chicks because birds brooded with infra-red lamps must have the benefit of better ventilation than is experienced by chicks under the type of canopy brooder in general use today, whether they are reared on litter or on wire frames. Observations have since shown that the absence of a chick canopy allows the rearer greater opportunity of observing the chicks during the early critical days of brooding. On the other hand, there is no apparent saving in the expense of rearing when the cost of current and the lamps is included. Therefore the value of these lamps for brooding must be assessed on the basis of the quality of chick raised and, if the lamps are to replace present equipment, the chicks should be better on the average than those reared under canopy brooders.

To obtain reliable information about the value of infra-red lamps in order that Departmental officers could offer advice to poultry producers, two courses of action were taken: First, Poultry Instructors were asked to obtain information based on observations at farms where the lamps were in use by means of a questionnaire, and, second, the lamps were tried under normal commercial conditions at the Poultry Demonstration Plant, Upper Hutt.

Reports from Poultry Instructors at first were reasonably favourable, but it could not be deduced from them that better chicks were being reared. During the most recent rearing season a further careful study was made of results being obtained on farms, and most of the chicks observed were not satisfactory. Unevenness among the chicks and noticeably pale legs among White Leghorns were recorded. In one brood reared under lamps 40 per cent. of the chicks had curled toes. Pale legs and curled toes are troubles reported from the United Kingdom, where no explanation for these undesirable characteristics has been found.

At the Poultry Demonstration Plant, Upper Hutt, three batches of chicks have been reared under lamps during the past two rearing seasons and in each case the chickens so reared were not considered equal in quality at the end of the brooding period to those reared at the same time under the canopy brooders used as standard equipment on the farm. The lamp chicks were less even in size and White Leghorn chicks exhibited a lack of leg colour.

In view of the reports from officers in the field and the differing reports from overseas regarding the efficiency of infra-red lamps for brooding on commercial poultry farms, it is intended to carry out a closely controlled experiment at the Poultry Demonstration Plant during next rearing season, using normal commercial size units of chicks. The results obtained from this experiment will be published in detail for the benefit of all interested in the use of these lamps.

Y.F.C. Members' Subscriptions

Details of the new Young Farmers' Club concession rate for "Journal" subscriptions are published in the January issue of the "Supplement". Only by payment of "Journal" subscriptions by 1 March 1952 at the latest can members be assured of receiving the April issue and so maintaining continuity. Paper shortages preclude printing large numbers of spare April "Journals" for those who take out subscriptions after 1 March and then request back numbers.

Members should therefore pay their "Journal" subscriptions as soon as possible. If these are endorsed "to begin with the April issue", continuity will be certain.

Lord Rutherford Memorial Appeal

TO honour the memory of one of the greatest experimental scientists of all time, Lord Rutherford of Nelson, the council of the Royal Society is appealing throughout the British Commonwealth for funds for the establishment of a Rutherford Memorial.

Born in 1871 in the Nelson Province, Ernest Rutherford was educated at Nelson College and Canterbury University College and studied at Cambridge University. He became a professor at Montreal, Manchester, and Cambridge. He died in 1937 and was buried in Westminster Abbey.

It is proposed that the memorial to Rutherford and his tremendous contributions to scientific knowledge should take two forms:—

1. Rutherford Scholarships, to be awarded to post-graduate students within the British Commonwealth for research in the natural sciences, and

2. A Rutherford Memorial Lecture, to be delivered at intervals at selected university centres in the British Commonwealth. At least one in three of these lectures is to be given in New Zealand, including the first of the series, this year, by Sir John Cockroft.

Rutherford was the father of modern nuclear physics. His genius for experiment and the brilliant interpretation of his observations led to practically all that is known about the structure of atoms. He always worked on problems at the limits of human knowledge and developed new methods of experiment to extend these limits still further. His personal contribution to scientific knowledge was immeasurable. He will be remembered also for his capacity to inspire others to fruitful interest and participation in his work. His achievements, personality, and forceful leadership attracted colleagues and students from all over the world and from his laboratories came many of the world's leaders of physical science today.

All countries have felt the effect of Rutherford's work through the influence of scientific men trained by him. All countries and all sciences have been helped in another manner by new facilities for investigation. Radioactive elements are a by-product of Rutherford's work. They give a new, more penetrating tool in studies in agriculture, industry, and human medicine.

His interest was not confined to purely academic science. As chairman of the Advisory Council of the Department of Scientific and Industrial Research of Britain he gave wise guidance to the British Government in the encouragement and extension of the use of the scientific method in industry. He was president of the council of the Royal Society from 1925 to 1930.

A sum of £100,000 has been suggested as the objective of the society's appeal. Of this £30,000 has been set as the target for New Zealand, and the appeal is being sponsored in the Dominion by Canterbury University College, which is receiving the support of provincial committees in Auckland, Wellington, Nelson, and Otago. Several thousands of pounds have already been subscribed by firms, local bodies, and private donors.

Donations to the Rutherford Memorial appeal should be sent to the Registrar, Canterbury University College, Christchurch, or to the Registrar of one of the other university colleges in Auckland, Wellington, or Dunedin.

Care and Treatment of Skins of Sheep Killed on Farm

IT is probably quite true that farmers receive the price they should for their sheepskins, but it is equally true that they do not receive all that they could. In this article R. G. Montgomery, Sheep and Wool Instructor, Department of Agriculture, Hastings, gives many reasons for low grading of skins and information on the care and treatment necessary to ensure that skins are graded higher.

SHEEPSKINS received at a skin store are graded into lots according to the quality of the pelt and the type and length of wool. Practically, skins of sheep killed on farms are put into three main grade lines, which are:—

First grade: Skins which have been well cared for and are of good condition and good pelt shape.

Second grade: Skins showing minor faults in the taking off or after-treatment.

Dead, damaged, and inferior: Skins not good enough for the first or second grades.

The main grades have subdivisions for wool type, length, and quality, but the condition and shape of the pelts determine their placing in the first three divisions.

It is almost impossible to assess an annual over-all loss, or wastage, on skins of sheep killed on the farm. The loss to New Zealand farmers and to the industry would probably be a staggering figure on one season's output, because about half of the farm sheepskins are graded "dead, damaged, and inferior".

Sheepskins correctly baled for export. No part of the pelt is exposed.

Sheepskin Grading

If many farmers examined their sheepskin returns closely, they would probably find that some skins are marked as "Seconds" and most as "D. & D.", the sign for dead, damaged, and inferior. If some skins are marked "First Grade", the difference in value brought about by a little care and attention becomes obvious.

After a skin sale in April 1951 two lines of half-woolled, medium cross-bred skins were sorted out that must have been similar when the sheep were killed. One lot had been well cared for and was graded "First". The other lot, neglected, badly treated, and damaged after killing, was graded "D. & D." The first-grade skins not only made 94d. a pound as against 79d., but because of careful drying they averaged nearly 2lb. a skin heavier; a difference of 18s. 6d. a skin.

[*National Publicity Studios photo.*

Loading sheepskins for export.

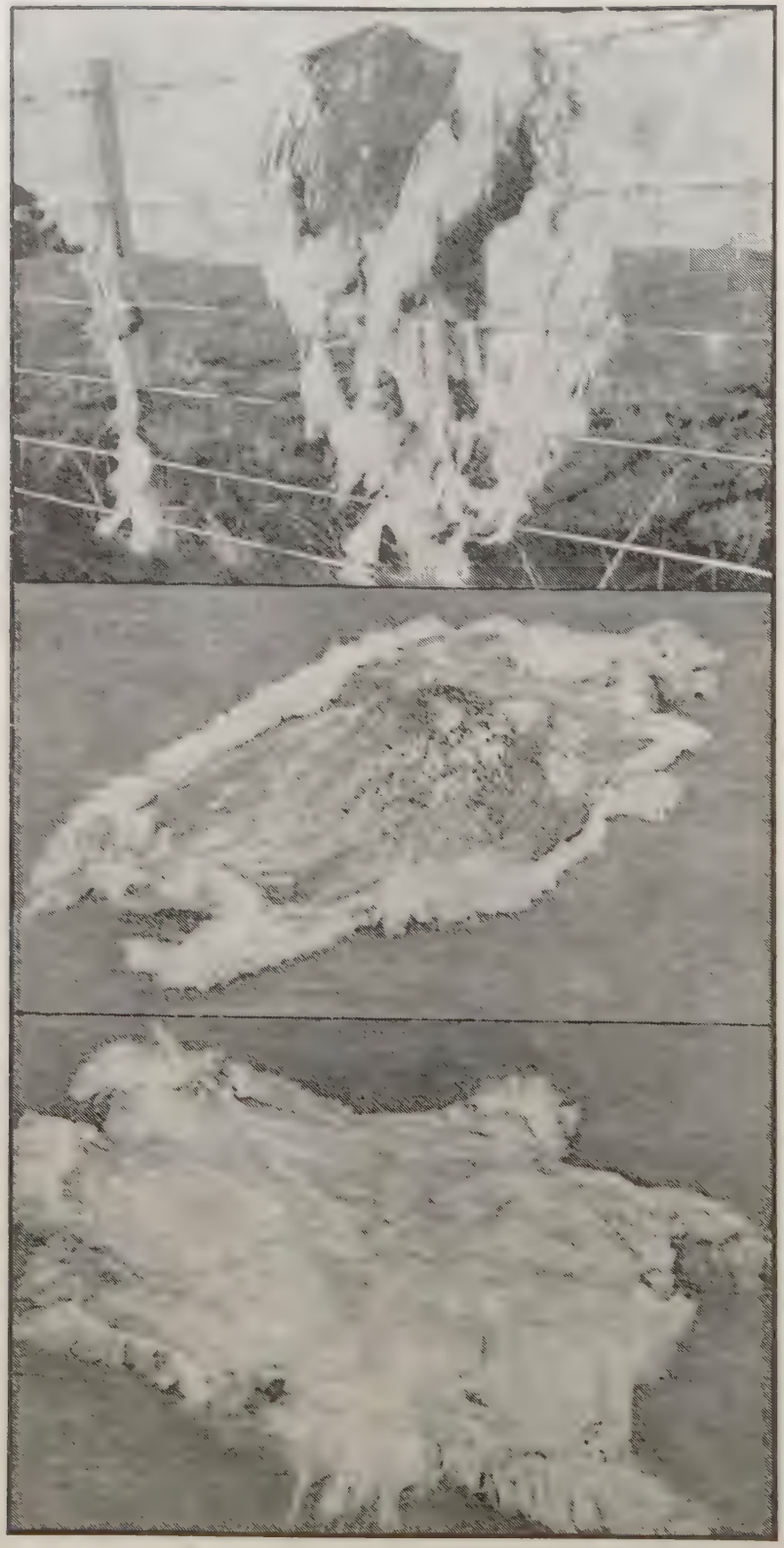
"Dead" Skins

Some farmers are under the impression that skins graded as "dead, damaged, and inferior" are those from sheep, other than those killed, that have died on the farm. This is only partly correct, for about half of the skins of sheep killed on farms go into that grade because of neglect when skinning or in after-treatment. More farmers should visit skin stores and examine their sheepskins after they have been graded. Though this would be very instructive, it is doubtful if many farmers would leave the store feeling proud of their products.

Farmers should realise that when they kill a sheep they remove a potential top-grade skin, but that that skin can and will be graded dead and damaged if it is badly handled when or after it is taken off.

Disinterested Workmanship

Perhaps because so many farmers have become accustomed to accepting



Upper—What could have been a first-grade sheepskin left over a fence to perish and waste. Middle—Badly weathered skin which had been hung the wrong side out and over a post. Lower—An untreated skin left on the floor, where it had dried out of shape.

the lower grading of their sheepskins, they fail to appreciate how achieving the top grading can affect the value of their returns. This apathy or general lack of interest in looking after sheepskins may be an aftermath of the days when the returns for skins did not warrant time being spent on them. Skins are now a valuable commodity, and if it is possible for a half-woolled, medium crossbred skin to give a return of approximately £2 15s. merely by a little care and attention, is a farmer doing his production figures justice if, by neglect, he lowers that return to about £1 16s. 6d.; a loss of something like 18s. 6d. on each skin? Hurried work at skinning and careless after-handling, followed by disinterested marketing, can cost a farmer a considerable amount of money on a season's output.

Handling Faults

About half the sheepskins produced in New Zealand are spoilt by careless handling. Some of the principal faults are: Bad flaying (skinning); using a blunt knife, which means using force, with consequent scores or cuts; too much use of the knife; leaving skins tossed over a fence exposed to the weather or direct sun; allowing a skin to sweat because it was not opened out and dried properly; and drying a skin out of shape, over a fence post, or thrown out on a floor. Other bad faults include leaving strips of meat or fat on a pelt, the pelt sweating or frying under the covering and then deteriorating to leave a flaw; leaving legs on the skin, thus spoiling the shape of the shanks and also providing an ideal starting place for sweating or parasitic attack. Legs left on the skin are used as handles, causing tearing of good skins. Treating skins by excessive use of a plaster-like mixture of dip and bad storage conditions are other faults.

Weathered, torn, and depreciated sheepskins draped along the rails of a sheepyard, strung out on a barbed-wire fence, or flung over a wire between two trees are familiar sights in many parts of the country. The dirty floor of a woolshed is sometimes strewn with badly dried and badly shaped skins. Ninety per cent. of farm skins should reach the top grades and that is allowing 5 per cent. for unavoidable damage and 5 per cent. for the few dead sheep that are actually skinned. The time taken in attending to skins is well worth it for it means the difference between 79d. a pound and 94d. a pound for a heavier article.

Care of Skins

To ensure that skins are disposed of to the best advantage the following points shouuld be considered:—

The construction, if possible, of a convenient and hygienic killing grating.

The standing of sheep before killing.

The avoidance of excessive blood on the wool or, where that is difficult, washing off of blood while the skin is still fresh. Excessive blood about the neck and shoulders is a bad fault, as it often leads to faulty drying, sweating, or attack by flies.

Flaying

When the first foreleg is opened up run the knife down the leg only as far

as is necessary to continue the opening cut across to the brisket. From the brisket continue up a centre line along the neck to the throat. Opening the second leg takes only a fairly short cut to intersect the first leg opening at the brisket. The opening up must be done correctly to get a good-shaped shoulder to the skin. After opening up use the knife as little as possible, but when it is used ensure that it is sharp. Use the handle of the knife for clearing the shins and use the hands as much as possible for the bulk of the flaying.

When the hind legs are opened skin shape must be again considered. Correct opening up will give a square skin; faulty opening up will give a bad shape with unshapely points.

The belly line must be opened evenly down the centre, otherwise the skin will have a bulge on one side with a corresponding hollow in the other.

The ears must be left on the skin when it is removed. It is illegal for any farmer to cut the ears off a skin or to be in possession of skins without the ears attached. Once the skin has been removed it should be allowed to cool before treatment.

Methods of Treatment

The method of treating skins will normally depend on local circumstances. Sun drying of skins is a popular method, as if it is done well, it allows skins to be stored and permits of a wide range of marketing. Salting of skins is a method which is advantageous to some farmers, but it confines a farmer's market to the fellmongers, though that is not necessarily a disadvantage. The method of marketing is very important, and farmers should test the markets in their locality. Avenues may include the local skin dealer who calls, the salted-skin market, the fellmongery, for fresh skins, and the cured- or dried-skin market.

Cured or Sun-dried Skins

When the skin has been taken off any fat, meat, or blood should be removed while the skin is still fresh, fat about the neck and tail being watched for particularly. Allow the skin to lose blood heat before any further treatment is given. The time taken for it to cool will depend on the weather. If a skin needs cooling, pick it up by the wool and then drop it tent-like on a clean base. This procedure, known as potting, allows air to circulate and quickly cools the skin.

The skin should then be laid out on a clean flat surface flesh side up and treated economically and efficiently with a good sheepskin dressing over the complete area of the pelt, particular care being taken with the shanks, points, and edges. A clear, colourless sheepskin dressing is recommended because the grader and the buyer wish to see the pelt. Heavy paste mixtures can act as a camouflage and graders, knowing that, usually put heavily plastered skins in second grade.

The application of a sheepskin dressing is not always necessary, but it is nevertheless wise to make a habit of treating all skins at all times. The use of an old broom cut down to fit into a half benzine tin is a good way to apply the dressing.

When the skin has been dressed it should be hung, flesh side up, over a 4in. rail or over two taut wires, stayed 4in. apart, with the neck and tail on the rail or wires; that is, the back line of the skin along the rack, with the sides hanging down. The wool on the tip of the tail should be tucked under to prevent the butt curling upward. Skins should not be left on the floor after dressing, as that allows the dressing to concentrate in pools and perhaps give overdone spots. If spread

Upper—A well-flayed sheepskin. Middle—A skin which has been well cared for. It was treated with a clear dressing and dried in 1931, since when it has been subjected to long periods of storage in different conditions and it has not been attacked by any form of parasite. Lower—Good, well-flayed skins, properly treated with a clear dressing, and hung the correct way. These skins were aired and bloomed in soft sunlight for a few hours each day.

If you switch to

DRY DRENCHING

with "PHENOVIS"

Phenothiazine Pellets

YOU'LL DRENCH QUICKER AND MINIMISE THE RISK OF WOOL STAINING.

THIS scientific phenothiazine DRY drench has won New Zealand-wide praise.

"PHENOVIS" Pellets are safe, accurate, labour-saving. Accurate dosage is certain because each contains exactly 5 grammes of phenothiazine. The dose, given by a special instrument, ensures no "spit-out" and minimises risk of wool staining during drenching. Easier to carry than heavy liquids—and there's much less chance of waste. Order now for the season ahead.

New Zealand Distributors:

SUMMIT PRODUCTS LTD.

Box 328, Palmerston North.

Railway Wagons and Tarpaulins

KEEP THEM MOVING

Day and night the railways are moving an unprecedented volume of freight traffic, and each working day more than 7,000 wagons are loaded for runs averaging 100 miles.

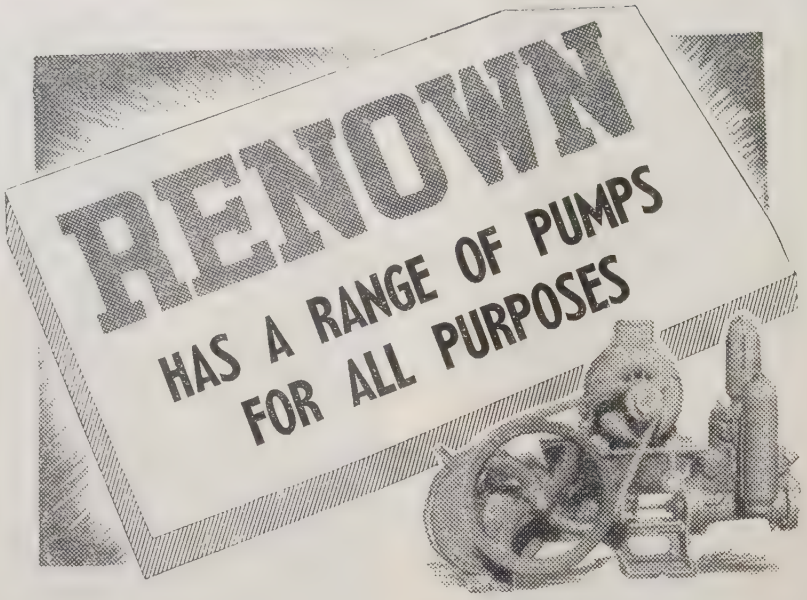
These wagons must be unloaded promptly at destination stations, in order to meet industry's demands for more and yet more empty vehicles. Delay in loading and unloading impedes transportation, and no wagon should be standing idle when it could be on the move with another consignment.

Remember, railway wagons are for transport . . . not for storage!

Load Quickly:

Unload Quickly:

Release Quickly



In a Renown Pump you have the product of a firm associated with Pump manufacturing since 1879, and whose staff and organisation is keyed to give the best of this long experience. Expert installation advice and service is always available.

W. H. PRICE & SON LTD. 34 - 36 MANCHESTER ST. P.O. Box 1084. CHRISTCHURCH.

New Firestone

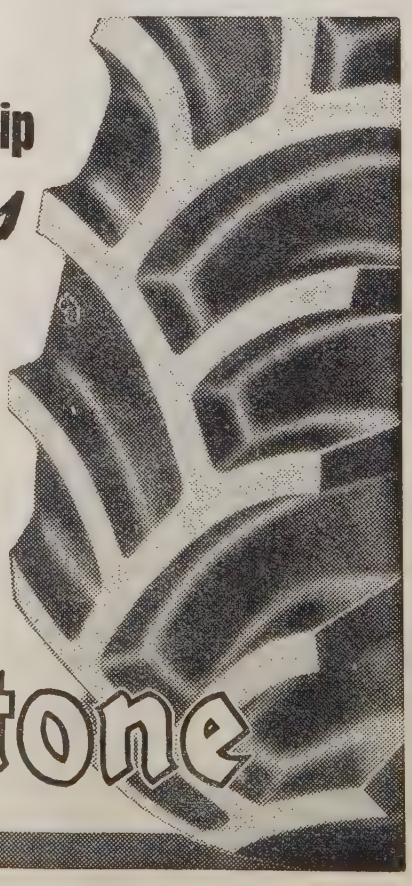
Champion Ground-grip

OUT *cleans*

OUT *pulls*

OUT *lasts*

any other tractor tyre



Firestone

on the floor, a skin tends to dry out of shape. If a skin is thrown over a rail with the head on one side and the tail on the other, it will not come back into good shape. The best place to hang sheepskins is in the shade in a current of fresh air. A dressed 4in. rail, suspended from the woolshed rafters, with a pulley at each end, makes a handy drying rack. Strong direct sunlight or open weather is detrimental to skin curing.

Skins may take several days to dry, according to the climate, and require occasional inspection if the best results are to be attained. By shifting them out into soft sunlight for a few hours a day an added finish or bloom is given to good skins, but care must be taken to avoid direct hot sunlight.

Normally, about the third or fourth day skins will be starting to set or be entering the final stages of drying, when they should be turned. Still keeping them flesh side up turn the skins on the rail to let them lie crossways; that is, head on one side and tail on the other. This helps to uncurl the edges and open out the flanks. They can be left thus to complete drying. When the skins are dry all over they can be bundled for transport.

Skins for transport should always be bundled or packed wool side out, as it is difficult to injure the wool side of a skin and all skins are graded on the quality and shape of the pelts. In spite of this, the bulk of skins arriving at skin stores are packed pelt side out. If there is scratch, a score, or a blemish on the pelt side of a skin, it will be classed as damaged.

Dried skins should not be held longer than is absolutely necessary and in no circumstances should skins be placed in a bale of wool.

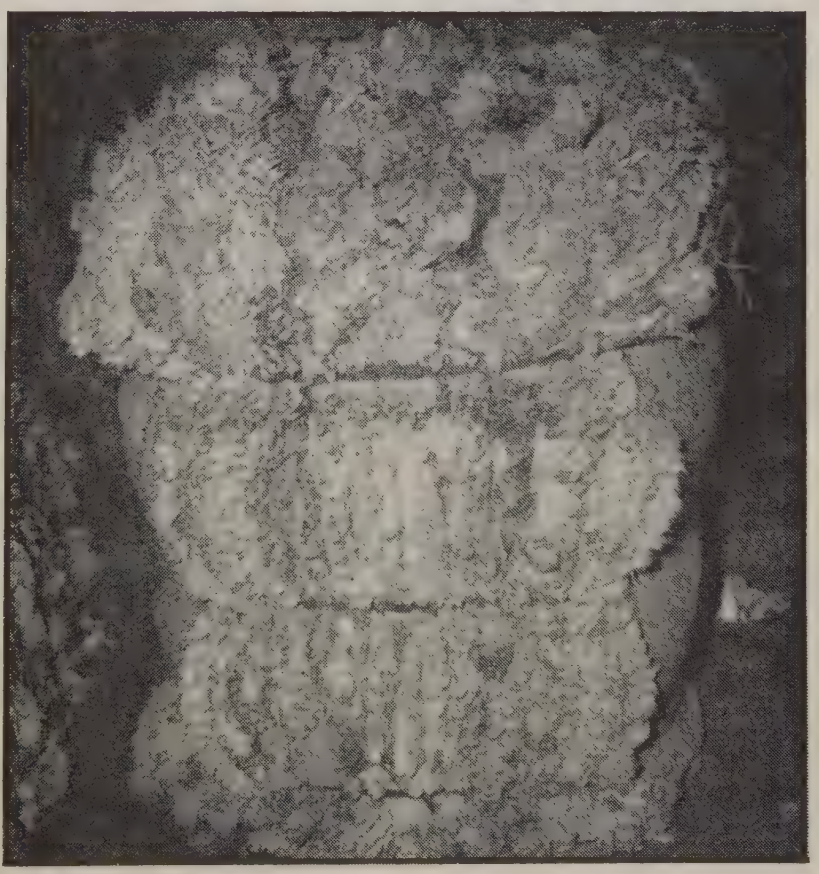
Salted Skins

The preparation of skins for salting is similar to that of skins for drying; excessive blood must be dealt with, any meat or fat scraped off, and the skin allowed to lose blood heat.

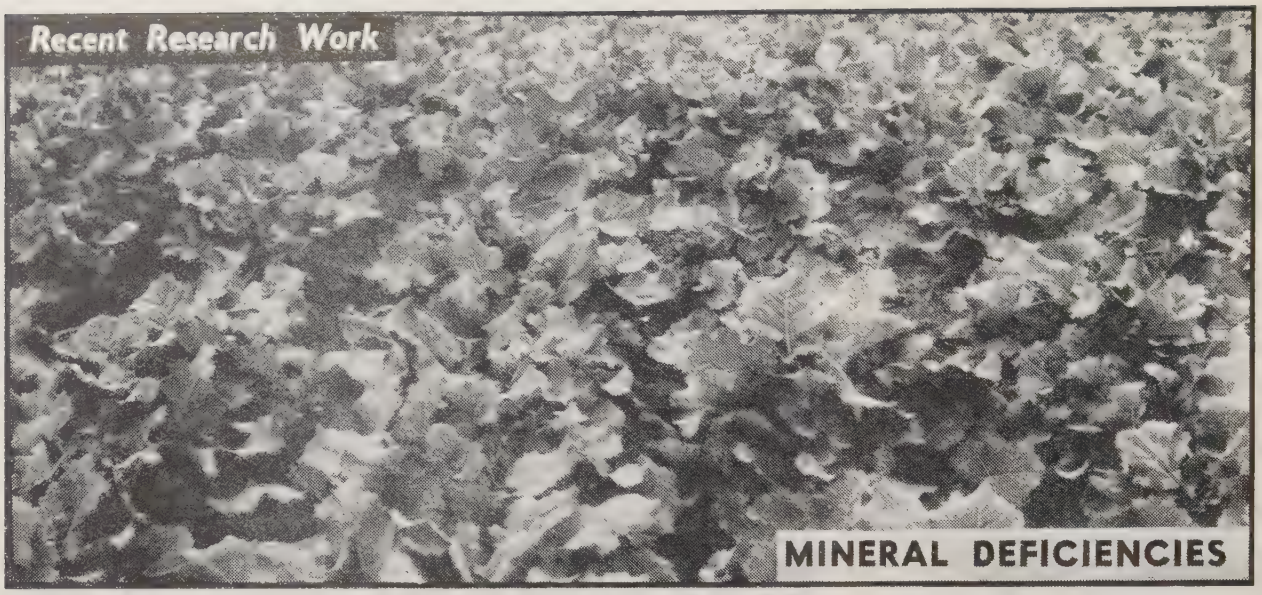
Salted skins are kept in small stacks. The first skin is laid out flat, pelt side up, preferably on a concrete floor, and evenly and completely covered with a layer of coarse salt. The second skin is so placed that about half the skin overlaps the first, the other half continuing along the concrete the way the stack is to lie. When the second skin is in place it should be salted and the next skin placed so that it overlaps the previous one by half. All skins go on pelt sides up and should be salted as soon as they are stacked. Stacking is continued until the pile is about 2ft. 6in. high, when a fresh stack should be started. Care must be taken to ensure that all skins are salted right out to the edges and that no points are curled or turned in. The amount of salt used should be enough to cover the skins evenly; about 2½lb. to a full-sized skin. The skins should be left in the stack for about a week to cure and then forwarded for marketing.

Salted or dried skins should never be stacked in a corner or against a wall, as this encourages attacks by rats, mice, or other parasites. Skins should be dispatched to market as soon as possible and should be labelled properly, and the consignee advised of the date of dispatch and the number of skins forwarded.

Skins neatly but wrongly packed for transport.



Skins should be packed wool sides out with pelt sides protected, as a scratch or tear means lower grading.



WORK on diagnosis of mineral deficiencies or toxicities in pasture plants, cereals, fodder crops, and tomatoes has been continued at the Department of Agriculture Soil Research Station, Rukuhia, during the past year. Various analytical methods and sampling techniques are being compared with a view to selecting the most reliable procedures. Conclusions to date from analytical investigations to determine the physiological significance and diagnostic value of visual deficiency symptoms follow.

NITROGEN NITROGEN DEFICIENCY in grasses is shown by yellowing and loss of vigour. Wheat, barley, ryecorn, and maize show over-all yellowing, especially of the older foliage, and premature death or "firing" of the lower leaves. In oats yellowing and death of the affected leaves are usually accompanied by a reddish-purpling coloration of the margins and tops of the leaves. Some varieties of maize or sweet corn also tend to show this pigmentation when nitrogen is deficient. Fodder crops and vegetables may be classified in a similar way into two groups, those which develop red tints along with yellowing of the older foliage (rape, chou moellier, turnips and swedes, cabbages, and tomatoes to a limited degree) and those which do not (mangolds, potatoes, and silver beet). Severe nitrogen deficiency always results in either stunted or spindly growth.

PHOSPHORUS FOLIAGE in most phosphorus-deficient plants is a darker green than in normal healthy plants. In plants lacking the property of pigmentation there may be no symptoms of phosphorus deficiency, but only stunting and retarded growth. Failure of deficient plants to mature is typical. In plants which develop purple anthocyanin pigment, symptoms of phosphorus deficiency are sometimes similar to those of nitrogen deficiency. Whereas in nitrogen deficiency the reddish pigment is associated with yellowish foliage, resulting in red or reddish-purple colour, in phosphorus deficiency the foliage remains dark green, giving a dark purple or violet marginal coloration. Even plants which typically show the purpling when mildly deficient, however, may show no symptoms when severely deficient. In the absence of leaf damage, etc., reddish symptoms when accompanying a yellowing of the older foliage during the main period of vegetative growth usually denote nitrogen deficiency; when associated with dark green foliage (giving a dark purple colour) phosphorus deficiency. Purpling tints in autumn or winter usually indicate only sugar development, not deficiency.

POTASSIUM POTASH DEFICIENCY typically takes the form of marginal leaf burn, especially in older foliage. In legumes such as white clover, red clover, and lucerne it usually shows first as a well-defined pattern of small white or pale buff spots toward the outer margins of the leaflets. These spots coalesce, the margins of the leaflets die, and the leaf collapses. Associated grasses in a pasture show little or no evidence of deficiency, though they tend to become yellower (nitrogen deficiency) due to the suppression of the clover growth and consequent reduction in nitrogen supply. In crops marginal paling of the foliage, followed by death of affected tissue, is typical, for example in cabbages, rape, turnips, and swedes. The dead tissue is normally stone or buff coloured, but in silver beet and mangolds is more of a dark brown or sepia shade and the dead areas are usually more irregular. Severe crinkle of the foliage is typical in silver beet and potatoes. In potatoes the leaves assume a bronzed appearance due to slight destruction of the tissue in the spaces between the veins; black areas of dead tissue and marginal leaf burn symptoms rapidly develop and early collapse of the haulms follows.

MAGNESIUM IN THE EARLY STAGE of magnesium deficiency in glasshouse tomatoes the tissue in the spaces between the veins of the lower leaves develops a distinct chlorosis, usually irregularly distributed in patches, sometimes over the lower and middle parts of the leaflets, sometimes toward the tips and margins. At a later stage the whole leaf may be affected and large reddish-brown areas of dead tissue appear, followed by collapse and death of the leaf. Symptoms appear first in the lowest leaves and progress toward the top of the plant. Topmost foliage always remains healthy.

BORON IN SWEDES boron-deficiency symptoms have been variously described as brown heart, mottled heart, heart rot, brown rot, brown spot, and "dropsy"; in beets, as crown rot, heart rot, dry rot, or internal breakdown. These terms describe the familiar symptoms of this deficiency in the most susceptible crops. Cracked stem in celery or hollow stem in cabbages and cauliflowers and surface and internal browning of the curd of cauliflowers are deficiency symptoms. In lucerne the deficiency takes the form of a yellowing of the tip foliage. (In other plants yellowing of the young growth, especially if severe, may be due to iron deficiency.)

GENERAL MUCH FURTHER WORK will be required to identify and differentiate the specific symptoms of mineral deficiencies in crop and pasture plants. Though deficiency symptoms are a useful aid to the farmer, gardener, or advisory officer, they can sometimes be misleading and should be checked by analysis where possible.

—K. J. McNAUGHT

Outdoor Tomato Trials at Lincoln

By G. PRIESTLEY, Acting Vegetable Research Officer, Department of Scientific and Industrial Research, Lincoln

DURING the 1950-51 season 12 varieties of staked tomatoes and 16 varieties of dwarf tomatoes were grown in a replicated trial at the Vegetable Section of the Crop Research Division of the Department of Scientific and Industrial Research, Lincoln. Most of the varieties grown were those which had performed well at Lincoln in single-row observation trials in previous seasons and therefore warranted a more extensive trial. Varieties normally grown commercially were included for comparison.

THE following were the varieties grown:—

Staked: Kondine Red, Potentate, 695, Gold Dust, Hundredfold, S x E.M., Woodwards Out of Door Wonder, Halls Stake, Stonors Exhibition, Corlys, Harbinger, and Potentate.

Dwarf: Stonors Dwarf Gem, T x 14A, Early Jersey, Sioux, Clarks Special Early, Early Santa Clara, Scarlet Dawn, Delvins Choice, Pearson 29-17, Victor, Puck, Pearl Harbour, Premier, South Australian Dwarf, Tatinter, and New Tatura.

Seed Sowing and Planting

Seed of all varieties was sown on 14 September 1950, a seed compost made up as closely as possible to the recommended John Innes formula being used. Seedlings were raised under glass and all varieties were pricked out on 28 September into boxes containing a pricking-out compost similar to the John Innes pricking-out compost.

Good set of fruit on top trusses of plant of Potentate.

Plants were hardened off in cold frames and transplanted into the field on 15 and 16 November. The staked varieties were planted 3ft. apart each way, and staked individually. Dwarf varieties were planted 3ft. apart in rows 4ft. apart. A general fertiliser mixture was worked into the soil before planting.

A very strong north-easterly wind after planting caused some damage to the majority of the plants.

Three sprayings were carried out during the season, two with wettable D.D.T. and one with copper oxychloride.

The 1950-51 season was exceptionally wet and cold at Lincoln, the rainfall from November to April being 26.59in., compared with an average of 12.30in. Part of the area was under water on three occasions. As a result of the exceptional, wet conditions and lack of sunshine the dwarf varieties made far too much leaf growth, and much top growth had to be removed to allow the fruit to ripen. Also, much of the fruit on the dwarf varieties rotted on the ground before it could be picked, so that the season proved unsuitable for a fair trial of dwarf tomatoes. However, despite adverse weather the majority of varieties gave a fairly good yield of good-quality fruit and their performance under adverse conditions could be noted.

The staked varieties were stopped after the fourth truss had formed to encourage ripening of the fruit.

Approximately 55 plants of each variety were grown, each row consisting of 11 plants of one variety, and each variety being replicated 4 times throughout the plot. Dwarf and staked varieties were grown in separate plots.

Picking, Grading, and Weighing

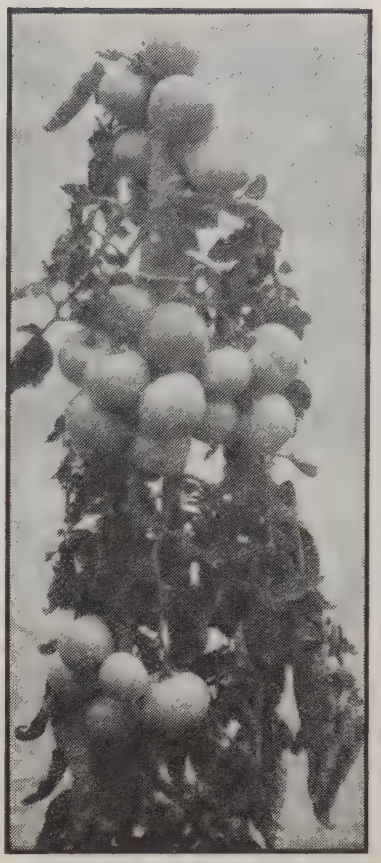
Fruit was picked regularly throughout the season. All fruit picked was graded by eye and the amount of fruit in each grade was weighed. This was done to get information on the average size of the fruit produced and on the amount of good, unblemished fruit that each variety could produce in an adverse season. Samples of fruit were also examined for inside quality. Details of the yield of each variety are shown in Table 1, on page 40.

The following were the grades used:—

For Staked Varieties

First grade dessert: Good-shaped, even fruit of good size and colour; fruit of more than 2¼in. diameter and more than 2oz.

Second grade dessert: Good-shaped, even, medium to small fruit of less than 2¼in. diameter and less than 2oz.; very small fruit (less than 1¼in. diameter) was not included.



Good set of fruit on top trusses of plant of Stonors Exhibition.

Other marketable fruit: Fruit of irregular shape or slightly blemished fruit suitable for commercial purposes but not suitable for dessert; also very small fruit (less than 1¼in. diameter).

For Dwarf Varieties

Since many of the dwarf varieties produce fruit mainly of a canning and sauce type, the designation "dessert" was not used in grading. A number of dwarf varieties, however, produced mainly dessert-type fruit and these are indicated in Table 2, on page 40.

First grade: Fruit of more than 2¼in. diameter and more than 2oz. but not necessarily of a smooth, even shape.

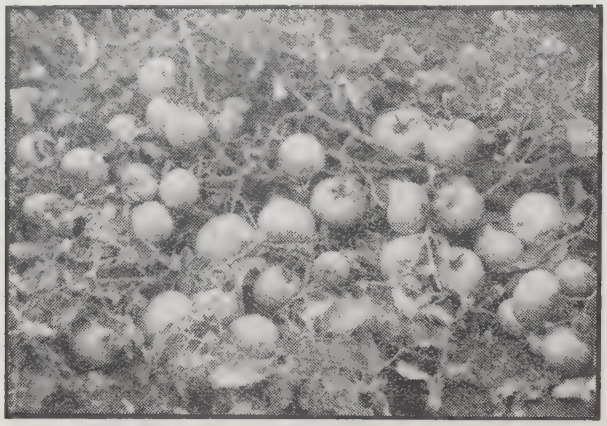
Second grade: Fruit of less than 2¼in. diameter and less than 2oz.

Other marketable fruit: Rough fruit and slightly blemished fruit.

Summary of Results

Staked Varieties

Yield: Varieties which gave the highest total yield of marketable fruit and the highest average yield of dessert fruit per plant were S x E.M.,



Good-shaped fruit on plant of Pearson, a late-maturing variety.

Potentate, and Kondine Red. These three varieties gave an average of approximately 8lb. of dessert fruit per plant.

Varieties in which more than 50 per cent. of the total weight picked consisted of first-grade dessert fruit included Kondine Red, Potentate, Halls Stake, and 695. The last variety, however, gave a very low total yield and its performance was not considered good in a wet season.

Varieties which produced consistently even fruit of medium dessert size and good shape and quality included Harbinger, Woodwards Out of Door Wonder, Hundredfold, Gold Dust, and S x E.M.

Earliness: The earliest variety to mature was Woodwards Out of Door Wonder, picking of which began approximately 3 weeks earlier than for the majority of varieties. Next were Harbinger and Hundredfold, picking of which began approximately a fortnight earlier than with Potentate. Picking of Woodwards Out of Door Wonder and Harbinger was completed about 3 weeks before harvesting of the other varieties was finished.

Woodwards Out of Door Wonder, Harbinger, and Hundredfold have been consistently early maturing at Lincoln for a number of seasons.

Cracking: Most varieties showed considerable radial and circular cracking in the exceptionally wet season, but Kondine Red, S x E.M., and Halls Stake showed little or relatively none. The fruit of Stonors Exhibition was badly blemished by heavy rain.

Dwarf Varieties

Yield: The varieties which gave the highest average yield of first- and second-grade fruit per plant were New Tatura, Tatinter, and South Australian Dwarf, all of which averaged 12 to 13lb. of graded fruit per plant. The fruit, however, of all these varieties, though mainly large, was irregular in shape and tended to be ribbed.

Varieties which gave fairly good yields of smaller but well-shaped fruit suitable for dessert and table use included Premier, Victor, Stonors Dwarf Gem, and Puck.

Earliness: The earliest-maturing dwarf variety in 1950-51 was Victor, which was a fortnight earlier than any other dwarf variety. The varieties Pearson, Early Jersey, Early Santa Clara, Delvins Choice, and Pearl Harbour were all rather late maturing for southern conditions, especially in a wet, cold season.

Among the varieties under trial at Lincoln this season the following performed well:—

Staked Varieties

Potentate gave a good yield, producing mainly large fruit, but in the early part of the season the fruit was mainly of a poor, irregular shape. However, it improved considerably toward the middle of the season.

Kondine Red gave a good yield of good-quality fruit. It showed very little cracking.

S x E.M., a cross developed at Lincoln, shows promise as a good-yielding variety producing consistently even fruit of medium size and very good shape. It shows very little cracking in a wet season.

Hundredfold proved a good early variety. It produced consistently even fruit of medium size. The fruit was of good quality and exceptionally uniform.

Harbinger: This is an outstanding early English variety, picking of which was completed about 3 weeks ahead of Potentate. Fruit was consistently even in size and shape and of very good quality, most of it being of medium size. The fruit was inclined to crack in a wet season.

Dwarf

Victor: This variety was outstanding for its earliness in the 1950-51 season at Lincoln, picking being begun a fortnight earlier than with any other dwarf variety. The fruit was mainly medium in size, smooth, and very regular in shape and suitable for table use. The average yield was good.

Puck: This is an interesting, newly developed variety from England originally raised by the John Innes Research Station. The variety has very short, sturdy growth, with short internodes, and is not so spreading in habit as other dwarf varieties. The fruit is held fairly well off the ground. The fruit was, however, mainly medium size to small, although of a very good, smooth shape.

Premier is a similar type of plant to Puck, but is slightly taller and produced fruit of better quality.

Pearson 29-17: This variety is too late in maturity for southern districts, but the fruit is of very good quality, being mainly large and of a good, deep shape and very smooth and even.

South Australian Dwarf, Tatinter, and New Tatura all gave high yields of canning-type fruit.

TABLE 1—CROPPING DETAILS OF STAKED VARIETIES

Variety	No. of plants grown	Total yield marketable fruit lb.	Per cent. of 1st-grade dessert fruit	Per cent. of 2nd-grade dessert fruit	Average yield dessert fruit per plant to nearest ¼lb.	First picking date	Last picking date
Kondine Red	52	442	55	38	8	16 Feb.	23 Apr.
Harbinger	55	379	35	50	6	6 Feb.	14 Mar.
Woodwards Out of Door Wonder	55	399	37	50	6¼	29 Jan.	16 Mar.
Gold Dust	55	428	35	57	7¼	19 Feb.	9 Apr.
Hundredfold	55	292	39	56	5	2 Feb.	9 Apr.
Stonors Exhibition	55	325	49	42	5½	19 Feb.	16 Apr.
Potentate	55	448	53	40	7½	23 Feb.	23 Apr.
*695	55	237	51	42	4	23 Feb.	23 Apr.
Halls Stake	52	341	54	40	6	16 Feb.	9 Apr.
Potentate	53	438	62	32	8	19 Feb.	23 Apr.
Corlys	54	315	48	45	5½	16 Feb.	16 Apr.
S x E.M.	54	454	41	54	8	16 Feb.	23 Apr.

* 22 of the plants of the variety were planted out from the seed box without being pricked out, as there were insufficient pricked-out plants for the whole plot.

TABLE 2—CROPPING DETAILS OF DWARF VARIETIES

Variety	Total yield marketable fruit picked from 44 plants lb.	Per cent. 1st grade	Per cent. 2nd grade	Average yield 1st- and 2nd-grade fruit per plant lb.	First picking date	Last picking date
Clarks Special Early	474½	58	37	10½	27 Feb.	23 Apr.
Scarlet Dawn	273½	66	28	6	19 Feb.	23 Apr.
Pearson 29-17	304½	59	35	6½	6 Mar.	23 Apr.
*Premier	321	17	74	6½	27 Feb.	23 Apr.
Early Jersey	396	71	26	9	6 Mar.	23 Apr.
*Victor	639	27	51	11½	6 Feb.	29 Mar.
Early Santa Clara	324	75	21	7	6 Mar.	23 Apr.
South Australian Dwarf	619	56	37	13	19 Feb.	29 Mar.
*Stonors Dwarf Gem	403	30	50	7½	19 Feb.	29 Mar.
Delvins Choice	147	70	28	3½	15 Mar.	23 Apr.
T x 14A	362	64	31	7½	27 Feb.	23 Apr.
Tatinter	569	64	33	12½	19 Feb.	23 Apr.
*Puck	360	36	50	7	19 Feb.	23 Apr.
Sioux	492	74	23	11	19 Feb.	23 Apr.
Pearl Harbour	273	51	38	6	6 Mar.	16 Apr.
New Tatura	612	70	27	13½	23 Feb.	23 Apr.

* Varieties producing fruit suitable for table use.

Establishing Permanent Pasture in Bay of Plenty

By A. V. ALLO, Instructor in Agriculture, Department of Agriculture, Tauranga

THE suitability of the Bay of Plenty for grassland farming is very apparent. Pastures yield very freely, and, from the relatively small amount of cropping done, it is clear that this fact is appreciated by farmers.

THE climate generally is excellent for pasture production, although a dry autumn will adversely affect production on many farms. Apart from dry autumns, there is ample rainfall for pasture growth, and relative freedom from cold winds and heavy frosts (except in inland districts) assists prolific growth. The soil, which varies from medium to light pumice loams to peaty silts, responds readily to phosphatic fertilisers, and even the poorest soils give surprisingly good returns if adequately topdressed.

Even so, there is room for improvement in the quality of many of the pastures. Six years of fertiliser rationing during the war were responsible for some deterioration in pastures, particularly on the higher country, but in many cases the reasons for low pasture production go deeper than this. Thin and weedy pastures lacking clovers and ryegrass and far inferior to those which the soil is capable of maintaining are seen frequently. Such conditions are often due to faulty methods of pasture establishment. This article deals with the putting down of new grass.

Prolific growth of white clover on pumice country at Te Puna, Tauranga.

Place in the Rotation

In the Bay of Plenty the types of land sown down to permanent pasture may be considered under four headings:—

Sown down on virgin country.

Sown down after an autumn-harvested crop.

Sown down after a winter-harvested crop.

Sown down after grass.

Virgin Country

Virgin country in the Bay of Plenty is covered either with bush, manuka scrub, gorse, or fern or a mixture of two or more of these. In many cases, particularly on unploughable country, scrub may be cut and burnt and sown down in autumn with a mixture of swedes and turnips and permanent pasture. Though this practice has resulted in some fairly good pastures, it is essential that land so developed should be well stocked with sheep and cattle rather than dairy cows so that second growth can be controlled. Development of large tracts of country by this method followed by under stocking, usually with dairy cattle, has nearly always failed.

Good results have been obtained on fern country by burning followed by a heavy harrowing. The grass seed is sown on the harrowed surface, which is then given a stroke with the chain harrows. For this method to be successful it is essential to get a clean burn; otherwise there will be too much surface litter and the harrows will not function properly. Subsequent stocking preferably should be with cattle to crush any fern which may reappear.

Virgin country capable of being cultivated is usually handled in this way, the common practice being to take a crop of swedes or turnips and follow this with either temporary or permanent pasture, according to circumstances. If the land is badly infested with gorse, it is cleared, burnt, and worked down, and sown either in swedes or temporary pasture. If the former, the swedes are followed with temporary pasture, which is, if possible, cut for hay during the first year to kill much of the spindly gorse that will appear. Such temporary pasture is oversown with the permanent pasture species after a year or two—when the greater part of the land is free of gorse. In dealing with gorse country it is usually considered advisable to allow the young gorse seedlings to come away after the burn and then to plough the land as deeply as the depth of the topsoil will allow. Any subsequent ploughings are shallower so that fewer of the buried gorse seeds will be brought to the top again.

In grassing down fern country one of the essentials is not to plough heavy fern growth under. This has been done on several farms, the result being a layer of undecomposed fern at the bottom of the furrow which will remain for several years. Any crop grown under these conditions has little chance of success, as the continuity of the topsoil and subsoil is broken and the land will dry out badly during summer. Fern country should always be burnt before being cultivated, unless it is intended to develop a block of sown grassland that has reverted to fern, when excellent work can be done using cattle as the implements of pasture regeneration. During the past few years many farmers have developed areas of rather poor fern country by using lupins to build up soil fertility. The land is burnt and disced and sown with 2 bushels of blue lupins per acre in spring. These are ploughed under in sufficient time to allow them to rot before the land is sown to grass. This method is to be recommended where a farmer wishes to obtain a good pasture on the poorer pumice soils.

Sowing after an Autumn-harvested Crop

The most commonly grown autumn-harvested crops are soft turnips and greenfeed maize. After these crops have been fed off the land is usually disced down and worked to a seed-bed for grass in March, good results being obtained if the working is sufficiently thorough and a consolidated seed-bed is obtained.

Sowing after a Winter-harvested Crop

Sowing down after a winter-harvested crop—the most commonly grown are swedes and cob maize—is more difficult than after an autumn-sown crop. For reasons that will be discussed later spring sowing is not normally recommended, so that the farmer has the alternative of summer fallowing his land or of growing a catch crop that will be out of the ground in time to allow the land to be worked up for grass the following autumn. Some farmers overcome the difficulty by sowing soft turnips or green maize, a practice which normally gives good results. A few have grown a green-manuring crop of lupins, a sound practice for anyone who can

5 types OF Power Plus

BATTERIES TO FIT

ALL MAKES

of cars, trucks, tractors.

Replace with a

Ford BATTERY

Five types . . . 9-plates to 15-plates . . . ensure the correct battery whatever make you drive. From Ford Dealers, leading garages and service stations.

FORD MOTOR COMPANY OF NEW ZEALAND LIMITED LOWER HUTT.

69.9

The Shortage of PHOSPHATIC FERTILISERS

New Zealand is short of phosphatic fertilisers and there is little prospect of an improvement in the supply. Therefore you should place your order now for BASIC SLAG which will be arriving according to shipping space available during the current season.

BASIC SLAG is a valuable source of quickly available phosphate for grasslands. Pastures must be topdressed to keep up production. Do not neglect this important work.

BELGIAN BASIC SLAG
SYBESCO

BASIC SLAG IS PARTICULARLY RECOMMENDED FOR USE BY ALL FARMERS IN THE HIGH RAINFALL DISTRICTS.

Wherever you travel by AIR-

BOOK WITH THE UNION STEAM SHIP CO. OF N.Z. LTD. Travel Service

At any of the Union Steam Ship Company's Branches throughout New Zealand you can book air passages within the Dominion or to any part of the world. You will find this booking service comprehensive and convenient.

AGENTS ALL PRINCIPAL AIR SERVICES

afford it, particularly on maize ground. Another alternative is to grow a crop of oats and sweet blue lupins to be harvested in December for silage. The ground could then be ploughed and fallowed until sowing time in March. Possibly this last practice is as sound as any. The disadvantage of a full summer fallow is the danger of winds blowing loose soil; land that is being summer fallowed should not be worked down too finely.

Sowing after Grass

Many farmers have paddocks of run-out pasture which they wish to resow in good Certified strains of seed. These paddocks are usually ploughed in December or January and resown in March, although sometimes they are ploughed in spring and sown with soft turnips for autumn feed, after which they are worked down and sown with grass seed in March. Any autumn supplementary fodder crop that is to be followed by grass must be out of the ground in time to allow the paddock to be worked down to a satisfactory seed-bed in autumn. If, as happens sometimes, autumn crops are not fed off before April, ground for grass has to be worked up in a very hurried manner, frequently with disastrous results to the young grass.

Cultivation

Thorough preparation of the seed-bed is of paramount importance. No matter how much high-quality seed is sown or how much fertiliser is applied the successful establishment of a pasture is greatly jeopardised if the seed-bed is not satisfactory. This is not always fully appreciated, and it is not uncommon to see seed being sown on a loose, unconsolidated, hurriedly prepared seed-bed. Seed sown under such conditions has little chance of establishing satisfactorily, and many failures in pasture establishment can be attributed directly to this cause. Success depends on early and thorough working. Early ploughing to a depth of 5in. is strongly recommended. A long mouldboard plough is preferable to the short mouldboard type, as it turns a better furrow on this type of country. After the land has been ploughed it should be rolled on the furrows to pack them down and then disced thoroughly to work up the ground to a fine tilth. If the surface of the ground is not very level, it can be smoothed out considerably by angle discing and by a few strokes of the clod crusher.

The final working should be done with harrows and roller, the aim being a seed-bed which is level, fine, firm, and moist, with no clods or lumps on the surface. All the operations mentioned are important in obtaining a good seed-bed, and ample time must be allowed to do the work properly. It is useless ploughing a piece of ground one week and then discing and sowing the seed within a few days. Early working permits the land to settle naturally, so that a mellow, weathered seed-bed is obtained.

In recent years there has been an increasing use of heavy discs in preference to ploughs. Sometimes, as on steep country, heavy discs can be used where the plough cannot, and the lower cost and higher speed of working with discs have helped to attract some farmers away from the plough. Giant discing must be done sufficiently early for the ground to have ample time to consolidate before the seed is sown.

Open, weedy sward due to rate of seeding which was too light.

Many farmers think that a good rolling before sowing the seed is sufficient to give a good, firm seed-bed. However, such a rolling probably will pack the top ½in. of soil, but unless every operation from ploughing onward is aimed at giving a firm seed-bed, it will be found that the soil under the rolled layer is loose and puffy. A Cambridge roller will not, in itself, give deep consolidation on loose ground, as many farmers have found to their cost.

After autumn harvesting of a crop such as soft turnips the surface of the ground is frequently in such a condition that a light discing followed by a good harrowing and rolling will give a satisfactory seed-bed. If this method of cultivation is adopted, it is easier to get a consolidated seed-bed. On the other hand, if the ground surface is rough or there is a large accumulation of weeds or surface litter, it is normally necessary to plough before working down the paddock for grass. If this is the case, it is essential that the crop be fed off in time for the land to be ploughed by the end of the first week in March at the latest, if best results are to be obtained. When land is ploughed out of grass in December or January for resowing into grass the normal routine of rolling on the furrow, discing, harrowing, and rolling should be followed.

Time of Sowing

The seed-bed should be ready for sowing between the middle of February and the middle of March, depending on the weather. Seed should not be sown during dry weather, but immediately after autumn rains. If sowing is delayed until late autumn and early winter, an early frost may nip off many young clover plants, and young ryegrass is subject to frost lift in inland areas, particularly the valleys, during winter.

Spring sowing is sometimes tried, with varying success. Often competition from annual weeds results in indifferent establishment, and weeds such as twin cress, which is commonly found in a spring-sown pasture, will give rise to strong feed flavours in cream if cows are grazed on the new pasture. A further point is that in recent years many spring-sown pastures have been severely checked during dry weather and in some cases pastures have had to be oversown. Normally, autumn sowing is strongly recommended. Seed should be sown on a rolled surface and lightly harrowed in, preferably with brush harrows, and the area rolled finally.

Although autumn sowing is normally advocated, this recommendation could be modified by a farmer wishing to get paspalum established on a farm on which there is not very much of this invaluable summer- and autumn-producing grass. Paspalum germinates best in warm soil, and if it is sown in autumn, particularly late in March, germination is often poor and establishment slow. On the other hand, September sowing, with almost certain heavy weed competition, is also frequently unsuccessful. In several cases good results have been obtained by sowing paspalum alone or with red clover in November and oversowing the balance of the pasture mixture the following autumn. A modification of this method is the sowing of paspalum and red clover seed with a swede crop in November, which has given excellent results in some cases.

Best results in pasture establishment are, however, obtained from autumn sowings.

Help the land fulfil its promise

— On the farmer's vision, initiative, skill and exertion depends the productivity of the land. Fulfilment of the farmer's plans also requires adequate finance and the National Bank is equipped to help by providing seasonal and short term finance for farming operations.

THE

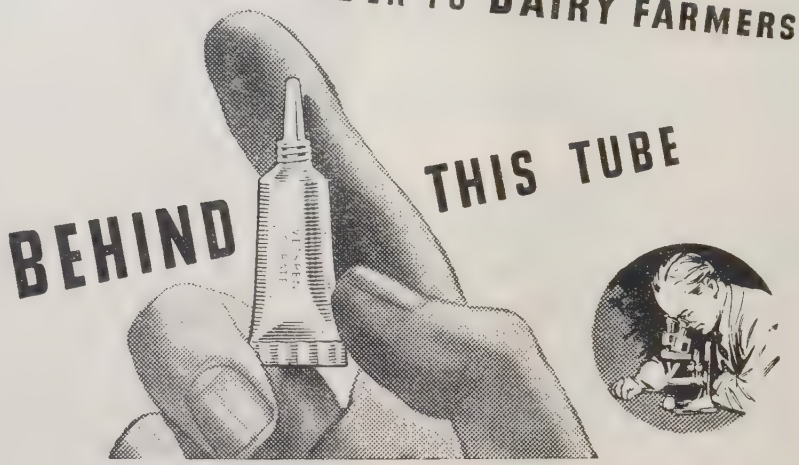
NATIONAL BANK

OF NEW ZEALAND LIMITED

119 Branches and Agencies throughout New Zealand.

A REMINDER TO DAIRY FARMERS

BEHIND THIS TUBE



of VETSPEN CERATE

Penicillin Udder Injection are the years of Glaxo research which pioneered the production of Penicillin in Great Britain. The same skill and knowledge that has developed Penicillin for the benefit of human beings goes into the production of Vetspen Cerate, the penicillin treatment that defeats mastitis (commonly known as mammitis).

VETSPEN CERATE has been proved by thousands of farmers during 3 seasons.

PRICE: 13/6 per dozen tubes.

GLAXO LABORATORIES (N.Z.) LTD., PALMERSTON NORTH

Supplied in 3/8" and 1/2" sizes of 2 braid construction for a working pressure of 300 lbs. per sq. inch and 3 braid construction for 500 lbs. working pressure.
Made in lengths of 500 ft.
Also supplied in wrapped ply type.

HORTICULTURAL HOSE

The modern high pressure power pump spray entails the use of a hose of exceptionally high quality and strength and Dunlop spray hose has been specially designed for this service. The rubber compounds used in the hose have been developed to meet the special conditions, the lining rubber being highly resistant to the chemical solutions used in spraying, whilst the cover is made to withstand the wear and tear of dragging over rough surfaces.

DUNLOP

DUNLOP NEW ZEALAND LIMITED

DH.1.9

Seed Mixtures

On the light soils of the Bay of Plenty, as on all other types of soil, satisfactory clover establishment is essential to the success of the pasture. Some farmers who omit white clover from the seed mixture claim that it will eventually come into the sward of its own account. The entry of such volunteer clover is usually slow, and in the meantime the grasses will have suffered owing to the deficiency of nitrogen normally supplied by the clover. Volunteer white clover is nearly always of a poor, low-producing type, and Certified white clover should never be omitted from seed mixtures.

Perennial ryegrass is also essential, as it provides the bulk of the spring feed and useful autumn feed. The value of short-rotation ryegrass under Bay of Plenty conditions is still under examination, though unquestionably the species produces a greater bulk of feed in winter and spring than true perennial strains. A weakness is that it tends to disappear during a dry autumn, particularly on the lighter country. Further investigation is needed on the behaviour of short-rotation ryegrass under various soil and climatic conditions before any conclusions can be made.

However, it is suggested that some Certified short-rotation ryegrass should be included in the pasture mixture—5lb. of Certified short-rotation ryegrass and 15lb. of Certified perennial ryegrass per acre on the lighter soils and 10lb. and 15lb. respectively on the heavier swamp country.

Weed-infested spring-sown pasture showing heavy infestation of land cress.

Paspalum Valuable

Paspalum is a grass of great value in the Bay of Plenty. Some farmers fear its prolific growth in summer and autumn and its habit of dominating a sward, sometimes to the extent of subduing or choking out other species, when unchecked for some years. With correct pasture management, adequate topdressing, and topping of pastures, however, paspalum can be controlled as readily as other pasture plants. The wealth of feed it will produce during summer and early autumn, when white clover and ryegrass are dormant, makes it a grass of great value in the Bay of Plenty and it should be used on every farm.

Cocksfoot is also of value, particularly on dairy farms on the higher country, and is worth including in the seed mixture. It will produce good summer feed and in a well-managed sward is a very valuable constituent of the pasture. Crested dogstail should also be sown, particularly on the higher country, its low, dense growth habit making it very useful for filling up thin places in a pasture. Timothy, which is very palatable to stock, should always be sown on the peaty silts, and many experienced farmers include a little of it in seed mixtures for the higher country. Because timothy is eaten readily by stock, it does not always show up in pastures, but there is a surprisingly large amount of timothy in many of the late hay crops.

It is impossible to give a grass seed mixture to suit all conditions in western Bay of Plenty, but the following are suggested as a basis on which to build up a mixture to suit local circumstances:—

SWAMP COUNTRY

	lb. per acre
Perennial ryegrass	15
Short-rotation ryegrass ..	10
White clover	2–3
Red clover (cowgrass) ..	3–4
Timothy	2–3
Cocksfoot	4–6
Paspalum (if required) ..	8

COASTAL AREAS AND HIGH COUNTRY

	lb. per acre
Perennial ryegrass	15
Short-rotation ryegrass ..	5
Cocksfoot	4–6
White clover	2–3
Red clover (cowgrass) ..	3–4
Crested dogstail	2
Timothy (if required) ..	2
Paspalum (if required) ..	5–10

It is essential that Certified seed be sown. Farmers have often sown so-called "cheap" seed which has proved anything but cheap.

Farmers should examine the Purity and Germination Certificate issued with every line of Certified seed. There have been some instances of farmers having poor results from Certified seed, but investigation has shown that the seed used was of a

Failure in pasture establishment on pumice land resulting from use of "cheap" seed.

low germinating capacity. If a farmer buys such seed, he should increase the rate of seeding to compensate for low germinating capacity. Two years ago a farmer sowed down 28lb. to the acre of a grass seed mixture, details of which were:—

	Purity per cent.	Germination per cent.
Perennial ryegrass	73	50
Cocksfoot	10.7	32
Red clover ..	5.4	0
Crested dogstail ..	5.3	16
White clover ..	4.5	42
Weeds	0.2	—
Inert matter ..	0.3	—

The sowing of this seed at the rate of only 28lb. to the acre meant that the farmer applied about 11lb. of living seed per acre. The rate was far too low and the resultant strike was so thin that it was necessary to oversow the area with more grass and clover seed. This example shows how essential it is for farmers to ascertain the germination of the seed before sowing it.

Rate of Seeding

The rate of seeding used in the Bay of Plenty varies considerably. Some farmers sow at the light rate of 20lb. per acre, claiming that by using more fertiliser and less seed they will ultimately obtain a better pasture for a certain expenditure. However, when a sowing is too light weeds usually develop in the bare places between useful plants and it may take up to 2 years for a pasture to thicken up properly. Heavy seedings, up to 60lb. per acre including sometimes over 30lb. of ryegrass, are also used. These give a very thick strike with too much competition between the individual plants, so that plants become "leggy" and spindly and stooling is very much retarded. The ideal rate of seeding should give an even strike sufficiently dense to cover the ground but not so heavy that plants are choked out. The rate varies according to the type of seeds in the mixture. Generally, a seeding of 35 to 40lb. per acre is satisfactory for a mixture based on those given in this article.

Manuring New Pasture

Phosphates are essential in the Bay of Plenty, and when a paddock is sown down to grass it should have a dressing of 3 to 4cwt. of "super. compound" or serpentine superphosphate per acre. This should be followed by a further dressing the following spring, after which regular autumn topdressing should keep the pastures in good heart. Any farmer who can afford it will find that spring and autumn dressings of 2 to 2½cwt. of phosphate per acre will give excellent results. On the Waihi Plains and on parts of the hill country of Tauranga County improved results have been obtained by using potassic fertilisers in addition to phosphates, and on such potash-responsive soils ½ to 1cwt. of muriate of potash per acre could be applied with advantage. The need for potash is becoming increasingly evident on many paddocks in the Bay of Plenty, and it will pay a farmer to ascertain whether or not there is need for potash on his farm.

On virgin land where humus and nitrogen are low good results have been obtained by manuring new grass with a mixture of 2cwt. of superphosphate and 2cwt. of blood and bone per acre, as the blood and bone helps the young grass to get away to a good start. The use of slow-acting (rock) phosphates is not recommended on new pastures in western Bay of Plenty.

Management of New Grass

The management of a paddock of young grass during the first few months of its life has a profound effect on its future productivity. Overgrazing of a new grass paddock is frequently responsible for poor production the following spring and undergrazing may result in suppression of white clover. The first grazing should be given, where possible, with sheep or light stock rather than with mature cattle, and it is preferable to use large mobs for a short period than to have a handful of stock trying to trim down a large paddock of new grass over a long period.

A paddock of new grass should never be grazed by heavy stock in wet weather. If the first grazing has to be done by mature dairy cows, they should be turned on to the paddock when the soil is reasonably dry.

Any system of management that permits even, light grazing will encourage the sward to thicken up and provide a dense cover over the ground. On no account should farmers succumb to temptation and take a cut of hay during the first year of a new grass paddock. This will severely check the ryegrass and clover and will lead to serious weakening of the sward.

The sowing down of new grass in the western Bay of Plenty offers no insuperable difficulties and success is bound up in the following of a few well-proven rules:—

1. Thorough and early preparation of the seed-bed to permit of adequate consolidation.

2. The autumn sowing of a suitable mixture of Certified seeds of satisfactory germination.

3. The provision of an adequate amount of seed per acre to give a good coverage of pasture plants.

4. The use of adequate supplies of quick-acting phosphates (and potash where necessary).

5. The correct management of the new grass.

Show Dates

THE following are dates and venues of A. and P. shows up to the middle of April.

*1 and 2 February—Buller A. and P. at Westport.

2 February—Clevedon A. and P. at Clevedon.

2 February—Rodney Agricultural Society at Warkworth.

*2 February—Woodville A. and P. at Woodville.

*5 and 6 February—Dannevirke District A. and P. at Dannevirke.

8 February—Dannevirke Ram Fair at Dannevirke.

8 and 9 February—Taranaki Metropolitan A. and P. at New Plymouth.

9 February—Golden Bay A. and P. at Takaka.

9 February—Hukerenui A. and P. at Hukerenui.

9 February—Katikati A. and P. at Katikati.

9 February—North Kaipara Agricultural Association at Paparoa.

*9 February—Pahiatua A. and P. at Pahiatua.

9 February—Waitemata A. and P. at Waiwera.

13 and 14 February—Ohura A. P. H. and I. at Nihoniho.

*15 and 16 February—Franklin A. and P. at Pukekohe.

15 and 16 February—Masterton A. and P. at Masterton.

15 and 16 February—Taumarunui and District A. and P. at Taumarunui.

16 February—Murchison A. and P. at Murchison.

16 February—Rangitikei A. and P. at Taihape.

16 February—Tauranga A. and P. at Tauranga.

16 February—Waiapu P. and I. at Ruatoria.

20 February—Te Awamutu A. and P. at Te Awamutu.

22 and 23 February—Wellington and Hutt Valley A. and P. at Upper Hutt.

23 February—Banks Peninsula A. and P. at Little River.

23 February—Putaruru District A. and P. at Putaruru.

*23 February—Te Puke A. and P. at Te Puke.

23 February—Waimarino A. P. H. and I. at Raetihi.

*27 February—Opotiki A. and P. at Opotiki.

1 March—Albany A. and P. at Albany.

1 March—Amuri A. and P. at Rotherham.

1 March—Maniototo A. and P. at Ranfurly.

*1 March—Matamata A. and P. at Matamata.

1 March—Mangonui County A. and P. at Kaitaia.

1 March—Temuka and Geraldine A. and P. at Winchester.

1 March—Whakatane and Rangitaiki A. and P. at Whakatane.

3 March—Tokoroa A. and P. at Tokoroa.

5 March—Morrinsville A. and P. at Morrinsville.

*8 March—Waikato Central Agricultural Association at Cambridge.

8 March—Kumeu District A. and H. Society at Kumeu.

8 March—Mt. Benger A. and P. at Roxburgh.

11 March—Lake County A. and P. at Arrowtown.

15 March—Hawkes Bay A. and P. (autumn show) at Hastings.

*15 March—Mayfield A. and P. at Mayfield.

15 March—Rotorua A. and P. at Rotorua.

15 March—Upper Clutha A. and P. at Wanaka.

15 March—Wellsford A. and P. at Wellsford.

15 March—Cheviot A. and P. at Cheviot.

*29 March—Hawarden A. and P. at Hawarden.

29 March—Waverley at Waverley.

5 April—Oxford A. and P. at Oxford.

5 April—Methven A. and P. at Methven.

5 April—Flaxbourne A. and P. at Ward.

14 April—Mackenzie County A. and P. at Fairlie.

14 April—Strath-Taieri A. and P. at Middlemarch.

* The Department of Agriculture exhibit will be staged at this show.

Effects of Minerals in Dairy Farm Water Supplies

AN adequate supply of suitable water is essential for dairy farmers to succeed in producing good-quality milk and cream. Some of the difficulties which arise when a farm water supply contains undue amounts of dissolved minerals are described in this article by S. G. Davidson, Farm Dairy Instructor, Department of Agriculture, Oamaru.

RIVER or creek waters may contain a variety of contaminating substances, including solid matter in suspension, derived from the land through which they flow. Such waters usually contain only small amounts of dissolved minerals, so they are quite suitable for use in the milking shed and for cleaning of dairy equipment, except where the stream is subject to pollution from drainage of various kinds. If it is necessary, stream water can easily be filtered to remove impurities.

Well and bore-hole waters, particularly if the bore is deep, are usually of high organic purity, owing to the filtering effect of their passage through the overlying strata, but they are often rich in mineral compounds derived from the same source. The hardness of such waters varies widely in different localities and supplies of water available from different sources may be regarded as dilute solutions of a number of chemical compounds, together with organic matter in suspension.

On many farms throughout New Zealand water drawn from springs, wells, or bore holes is the main source of supply to the milking shed. In many cases such supplies, particularly hard, corrosive, and iron-bearing waters, are unsatisfactory for use in cylinders of electric water heaters and give much trouble in the cleaning of dairy equipment.

Damage to Electric Water Heater

Where water which is hard owing to dissolved minerals is used its effect on the efficiency of the cylinder of the water heater will soon become noticeable. After the heater has been in use for a period the water, instead of being heated to the normal temperature range under thermostat control (196 degrees to 206 degrees F.), obviously is not becoming as hot as formerly, and as time goes on this lowering of temperature steadily becomes worse. The reason for this will be obvious if the heating element is removed and inspected, when it will be found to be covered by hard mineral deposits which act as an insulating medium and impair the efficiency of the element.

If the element were left long enough in the cylinder without attention, these deposits would build up and cause the element to burn out when they became thick enough to prevent the water having contact with it. By the same process the heating of the water would become progressively slower. For these reasons efficiency of electric water heaters is considerably reduced where hard water is used.

Should water of an acid nature be used in the heater, corrosion of the joint where the tap is fitted to the heater may quickly occur and cause a leakage. A brownish encrustation may form owing to the corrosion of the iron pipes.

The Milking Machine

To clean the milking machine properly it is necessary to rinse it thoroughly with cold water to remove all traces of milk, and whether or not the water is hard or otherwise unsatisfactory, there should be no restriction on the use of large quantities at this stage. The recommended procedure after a complete rinsing is to flush the machine with a solution of boiling water and caustic soda at the rate of 1 heaped teaspoon of caustic soda to 4 gallons of boiling water. If hard water is used, some curdling takes place when the caustic soda is added to the water. The cleansing effect will then be weakened, but this can be compensated for by using a suitable soda ash mixture containing a wetting agent to supplement the caustic, as described by G. M. Moir in the "New Zealand Journal of Agriculture" of February 1951. One teaspoonful of soda ash mixture should be added to the boiling water, and to get efficient results it is most important that the soda ash be dissolved before the caustic is added.

The solution resulting from this mixture is used at the rate of 1 gallon to each set of teat-cups, followed by at least 1 gallon of clean boiling water to ensure that all traces of the solution are removed. If this is done twice daily, it is usually sufficient to keep the milking machine in a bright, sanitary condition, especially if the water used is reasonably soft.

[*National Publicity Studios photo.*

Where very hard water is used for cleaning there is early evidence of the inside surfaces of the metal parts of the milking machine and utensils becoming dull, owing to a deposit of a hard whitish precipitate derived from limestone or other minerals. If iron-bearing water is being used, the deposit will be seen as a reddish-brown film. When used cold these waters do not usually leave any deposit, but when they are applied hot or boiling the deposit soon appears. The continued use of hard water causes a progressive accumulation of such deposits.

At the same time these deposits build up on the heating element of the electric cylinder and prevent the water reaching a temperature high enough to clean and sterilise the milking machine and equipment thoroughly. Although a stronger solution of caustic soda is used, or a soda mixture is added to the solution, the water will not be hot enough to remove the fat from metal and rubber parts. When the rough surface develops inside the metal pipes of the machine bacteria grow in large numbers and soon provide a serious contamination. As the water is not hot enough to remove the fat from rubberware, this will perish more rapidly owing to the penetration of such fat.

The contamination from deposits, and from bacteria which are harboured in these deposits and which have developed because the water temperature is not high enough, is serious and good-quality milk and cream cannot be produced under such conditions. The separator and buckets will also be encrusted, although perhaps not as much as the metal of the milking machine. Hard water is quite satisfactory for cleaning the floors, walls, and yards of the dairy premises, but in the case of iron-bearing water the concrete will be stained a reddish brown and become unsightly.

A convenient and satisfactory method of removing mineral stone is that recommended for the removal of milkstone in Department of Agriculture Bulletin No. 347, "Farm Dairy Instruction".

Softening Hard Water

There are various methods of softening hard water, and farmers are advised to have an analysis taken, as this is essential before any softening process is undertaken. Analysis will ascertain what organic or mineral compounds are contained in the water, and the degree of hardness. Where acid is present the water can be treated by adding certain mild alkaline substances, and by filtration through a suitable medium, as by the Permutit process, such waters can be softened. The hardness of the water governs the softener required to ensure a satisfactory supply. The Permutit sand can be regenerated by treatment with a strong salt solution. Filtering methods for softening water, although effective, may be unsuitable in farm dairy premises, and it is suggested that a water tank of at least 600 gallons capacity be installed at the milking shed for holding rain-water. This should be sufficient to ensure a good supply of soft water, but if this supply is to be drawn upon for cooling milk or cream, the holding tank should be installed underground.

If a rain-water tank is installed at the dairy premises, a supply of soft water for use in the electric heater and for cleaning the equipment is assured, and the difficulties arising from the use of hard water are overcome. The equipment will not perish and corrode as rapidly and the necessary removal of mineral stone from the metal parts will be less frequent. Unless soft water is used in the electric cylinder and for cleaning the dairy equipment, corrosion and encrustation will constantly occur, and in turn dairy produce will be lowered in quality by coming into contact with the encrusted deposits and by ineffective cleaning of equipment because the water used in flushing is not boiling.

Summary of Corrective Methods

Suggested methods of overcoming the difficulties arising from the use of hard water containing large quantities of dissolved minerals are as follows:—

1. Wherever possible a tank should be provided for holding rain-water exclusively for use in the electric water heater and for flushing and cleaning the milking machine and dairy utensils.

2. A soda ash mixture may be used with a caustic soda solution as already described. A solution of this kind is particularly useful in washing the dairy utensils, apart from the flushing of the milking machine. Though this cleaning alternative will improve the condition of the dairy equipment, it obviously will not prevent the formation of mineral deposits on the element of the electric water cylinder, nor prevent a reduction in its efficiency. Soft water is essential for this purpose.

As stated, there are various methods of softening hard water, and where necessary the advice of Farm Dairy Instructors should be sought. The installation of suitable water-softening equipment will involve some expense, and the farmer must be prepared to give the equipment regular attention to get satisfactory results.

An Improved Air Admission Method for Use on Milking Machine Claw Pieces

By W. G. WHITTLESTONE, Physical Chemist, Department of Agriculture Animal Research Station, Ruakura, and W. G. BATT, Supervisor of Farm Dairy Instruction, Department of Agriculture, Hamilton

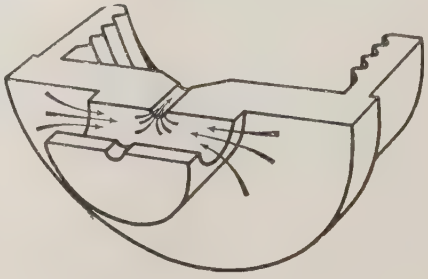
IT has been evident for some time that the milk tube of the claw piece of certain milking machines does not clean satisfactorily. This article describes a simple modification of the claw cap air admission method which obviates this difficulty. The new claw cap was developed at the Department of Agriculture Animal Research Station, Ruakura, and has been shown after a year's trial in the field to be superior to other attempts to solve the problem.

YEARS ago it was customary to supply air admission in the claw by piercing the claw cap with a small twist drill or by filing a groove in the thread on the end of the claw milk tube. Both methods were found to be unreliable because of blockage by dirt or the drawing in of insects.

To avoid the effects of dirt it has become customary to drill the air admission hole between the nipples, so protecting the orifice against the collection of dirt caused by its being rubbed against a dirty surface. This results in the air being drawn into the milk tube some distance from the closed end, so creating a "dead end". During the cleaning process milk may remain in this dead space to decompose between milkings and so become a fruitful source of bacterial contamination in the machine. That this will sometimes occur is evident from the nature of the cleaning process, which depends on the scrubbing action of air mixed with the cleaning solution. There is no turbulence or scrubbing in a "dead end" and hence milk deposits may build up.

The solution lies in putting the air admission hole back in the end of the claw in such a way that flies and dirt are not drawn into it. Why is it common to find an insect or a piece of straw or the like drawn into an air admission hole? The answer is that when a small hole (1/32in. diameter) is connected to a 15in. vacuum it draws in a lot of air. All of this air has to concentrate at the tiny opening and so it moves in at a high speed. An insect or a floating piece of straw is immediately drawn into the hole if it comes near this region of fast-moving air. Further, when the air hole is in the end of the claw it is likely to bump against a dirty surface of a cow. This results in the blocking of the hole.

In the diagram on this page is shown a claw cap which obviates the troubles outlined. The cap is made with a boss in the centre. Through this boss the 1/32in. air admission hole is drilled. Across this hole is a $\frac{1}{8}$in. hole drilled at right angles and opening to the air on opposite sides of the boss. This simple device meets both objections raised to the hole described above. All of the air passing through the 1/32in. hole now first enters the two $\frac{1}{8}$in. holes. A $\frac{1}{8}$in. hole has 16 times the area of the 1/32in. hole and there are two entry ports. This means that the speed of the air going into the two ports is only 1/32 times what it is at the small 1/32in. hole. This reduction in speed reduces the chances of an insect or piece of straw being drawn in. Further, the chances of a fly being trapped are now greatly reduced



Claw cap devised at Ruakura.

because it would be necessary for two flies to sit on the opposite ports at the same time before they would be firmly caught by the vacuum. This is rather unlikely. A glance at the diagram will also show that bumping the cap against a dirty surface is not likely to result in a blockage. The outer 1/32in. hole being blocked does not matter. Its only purpose is to enable the farmer to push a piece of wire through into the inner hole as a routine check on its being clear.

The new type of claw cap with protected air admission was given trial, under R. W. Naylor, Farm Dairy Instructor, Department of Agriculture, Te Awamutu, on five different milking machines in use last season and the duration of the tests ranged from 1 to 3 months.

Machines which had previously shown considerable deposits between the air admission hole and the cap were selected, and the new type of claw cap was used in one or two bails, the older type being used on the remaining sets. Both claws therefore received the same cleaning treatment and were subjected to the same shed conditions.

In each case the claws fitted with the new type of cap were found to be in satisfactory condition at the close of the trial, while those of the older sets contained deposits to a varying extent.

The "dead end" or "pocket" formed on claws where the air admission hole is placed on the claw tube has been the cause of considerable contamination from a quick accumulation of deposits. The range has been from a trace to the extremes in which the "dead end" becomes almost filled. It is expected that the new type of cap will be well received by milking-machine manufacturers and be of benefit to the dairy industry.

Seed Selection and Harvesting Can be Begun in the Home Garden in February

By C. L. NAPIER, Orchard Instructor, Department of Agriculture, Hastings

WITH the maturing of some of the earlier-planted crops some home gardeners will be considering selecting and saving seed in readiness for next planting season. Plant selection for seed production begins early in the life of the plant, so it will not be possible to make selections from some crops growing at present, but home gardeners should be able to select and set aside plants of later-maturing crops. The following information should enable gardeners to attempt seed saving on a wider scale during subsequent seasons.

SELECTION of seed can be most interesting and fascinating, but unless a few basic principles are first understood, unexpected results may appear in subsequent crops. The chief advantages in home selection of seed are that the gardener can select strains of plants according to his own ideals, and more important, he can select those most suited to his particular locality.

As New Zealand's climatic and soil conditions are extremely variable, not all "popular" varieties of vegetables can be claimed to be suited to Dominion conditions as a whole. Careful selection of varieties will, however, permit the gardener to develop gradually strains within those varieties most suited to his particular locality. In districts with short growing seasons, for instance, quick-maturing forms would be valuable as also would be those that could be raised in winter.

Precautions in Selecting Plants

Before seed saving can be successful there are several important factors that must be considered. First and most important is that of purity of line; that is, a strain of plants that will produce offspring identical with, or better in some respect than, themselves. Variation of strain from generation to generation is usually brought about by cross-pollination. As some kinds of vegetables cross very readily it is essential to isolate those from which it is intended to save seed.

For the purpose of seed saving, vegetables can be classified into three main groups as follows:—

Self-pollinated (some cross-pollination, but percentage negligible): Broad and french beans, tomatoes, peas, lettuce.

Self-pollinated (cross-pollination often occurs under natural conditions): Pumpkins, marrows, cucumbers, celery, runner beans, carrots and parsnips (may cross with wild types).

Natural cross-pollination: Asparagus, beetroot, broccoli, cabbage, kohl rabi, onion, radish, spinach, silver beet, spinach beet.

Seed from the first group may be saved without special precautions being taken during the growing life of the plants. Resultant crops will not show any appreciable deviation from the original strain, but annual reselection of desirable types will tend gradually to improve the strain.

Enclosing Flower Heads

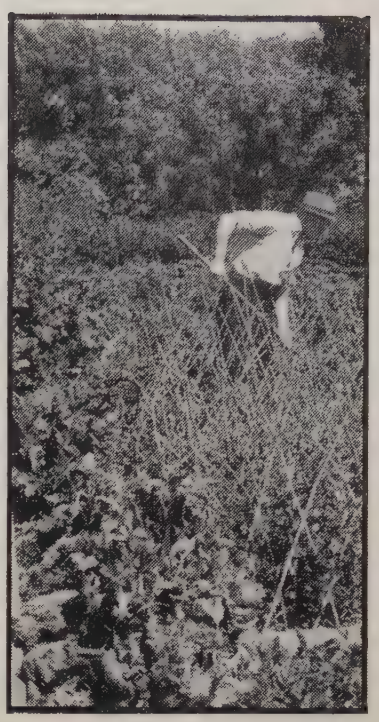
Seed from the second and third groups will tend to give small and large percentages respectively of off-types unless some form of isolation is practised. In commercial practice, distances of up to half a mile between the plants and those with which they might cross-pollinate are recommended, but such isolation is impossible in home gardens. The retention of purity of strains is therefore difficult with vegetables in groups two and three. Some means of enclosing the flower heads at pollination time should be adopted to prevent cross-pollination. Such procedure is reasonably easy with plants such as cabbages, carrots, onions, and beetroot, which have a single seed stalk or a small number of seed stalks and fairly compact seed heads.

The two simplest forms of enclosure are bags to completely enclose the seed head and wooden frames covered with muslin or similar material to cover the complete plant. Bags can be made of a transparent paper or of cotton material such as gauze or muslin. Whatever material is used, it should allow some degree of air circulation and yet not be open enough to allow the passage of pollinating insects. Covering of the seed heads or plants must be carried out before the flowers open, otherwise crossing may occur. A reasonable circulation of air is required, as moist or very hot conditions within the enclosure will tend to reduce even self-pollination. Small pinhole perforations made in paper bags allow ventilation and assist cooling during hot weather. Paper bags are not satisfactory during wet weather. Muslin bags, although more satisfactory in some respects than paper bags, tend to become limp in wet weather. A frame of light bamboo or wire, inserted before the bag is slipped over the seed heads, will prevent the bags from sagging.

Bags must be sufficiently large to allow for the elongation of vigorously growing seed heads. This is best achieved by allowing plenty of room when making the bags and by securing them as high up under the seed head as possible. If a pad of cotton-wool is wound round the seed stalk, there will be little danger of damage to the stalk and the cottonwool will assist in preventing entry of insects. Heavy seed stalks may require staking, and if the stakes are tall enough, the tops of the bags can be secured to them, thus providing additional support.

Isolating Complete Plants

Wooden frames covered with muslin or similar material are ideal for isolating complete plants, and they can be



[*Green and Hahn Photography Ltd. photo.*

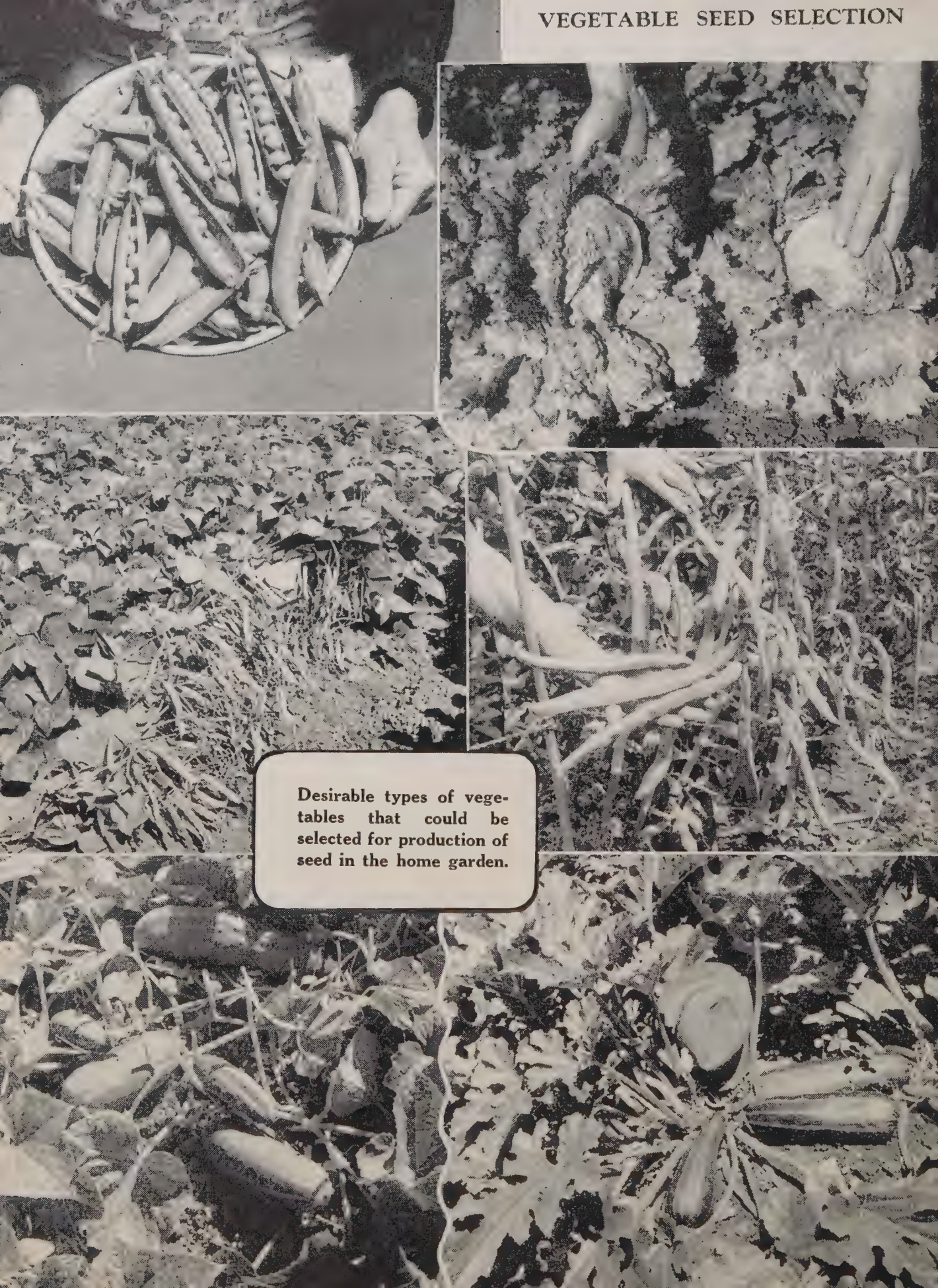
constructed to any shape or size. With frames, as with the bag type of enclosure, sufficient room should be allowed for further elongation of the seed stalk. Wooden frames isolate the complete plant and a healthier line of seed is assured, as no insect is able to feed on the foliage or infect the plant with disease. Some virus diseases are seed borne. The same viruses may also be spread by insects such as aphides. The importance of the best possible isolation is therefore evident.

Plant Selection

Selection of plants for subsequent seed saving offers great possibilities to the gardener for plant improvement. Selection over a period of years can quite possibly change entirely the characteristics of a particular kind of vegetable. Many home gardeners who find enjoyment in selecting something different follow such practice. The many kinds of vegetables grown cover a very wide range of characteristics, desirable or otherwise, that the gardener should look for. Among the most desirable characteristics are increased cropping capacity, resistance to disease, uniformity and purity of line, and ability to stand hot, cold, dry, or wet conditions.

Selection should begin from the time a plant is planted out. Plants showing undesirable characteristics should not be retained for seed production.

Two methods of selection normally are adopted; the first is termed single-plant selection and the other mass selection. In the first method single plants possessing the most desirable characteristics are selected; in the



Desirable types of vegetables that could be selected for production of seed in the home garden.

second a whole crop will be rogued to eliminate the undesirable types, the remainder being grown on for seed production. The first method tends to give superior types of plants, but a longer time may be required to build up a seed supply. For the home gardener the single-plant method undoubtedly is easier and more practical and should provide sufficient seed for his purposes. The mass-selection method with rogueing of off-type plants is the method often used in commercial practice where large quantities of seed are required. As it is not possible to give detailed attention to each plant under mass-selection conditions, seed saved in this manner tends to give more variation of strain than seed from single-plant selection.

Plants can be divided into two main groups according to their seeding habits, annuals and biennials. Annuals grow and produce seed in one year, whereas biennials produce seed during their second year of growth. A simple classification is as follows:—

Annuals: Beans, peas, corn, cucumbers, pumpkins, tomatoes, marrows, lettuce.

Biennials: Cabbages, cauliflowers, carrots, parsnips, beetroot, onions, leeks, potatoes, turnips.

Vegetables of which the seeds and fruit are eaten are annuals and most root, leaf, and stem vegetables are biennials. The production of seed from annual vegetables does not present any particular difficulties, nor does it take much longer than the normal growing time of these crops. Biennial plants, however, must be grown for two seasons, unless the locality is favoured by conditions that allow a long growing season. Where possible individually selected annuals should have their entire crop left until the gardener is certain that the plants selected are the best available. He then can discard the inferior fruits from each plant, leaving the remainder to mature fully.

Advice on the selection of seed of the main kinds of vegetables follows. In all cases only plants that appear disease free should be selected. Apparently healthy plants growing beside diseased ones should not be chosen, as they may carry a primary infection not noticeable to the naked eye.

Beans

Bean plants with the capacity to produce heavy crops held well off the ground should be selected. Tenderness (lack of strings), flavour, and size of pods are other important characteristics. Where possible selected plants should be marked and all pods allowed to mature. Any pods showing undesirable characteristics can then be destroyed. The gardener should try to select plants that are most alike in varietal characteristics. Pods should be allowed to ripen well before plants are pulled, but plants should not be left until the pods shatter. If plants are pulled in early morning, shattering of pods will be reduced considerably. Plants can be hung head downward in bundles in an airy, dry place until the seed is hard, when it should be shelled and spread out to dry off thoroughly before being stored.

Photograph at top right on opposite page by Green and Hahn Photography Ltd.; all others by Sparrow Industrial Pictures Ltd.

Sparrow Industrial Pictures Ltd. photo.

Good trusses of uniform fruit of the type of tomatoes that should be selected for seed.

Peas

Most desirable characteristics of beans apply similarly to peas. An additional one, which is fairly important, is sweetness, which has helped to make peas so popular. As usually the seed only of peas is eaten, selection should take into account the size of the seeds and the number in each pod. Pea seed should be harvested in the same way as bean seed.

Tomatoes

Robust tomato plants that bear good crops of high-quality fruit should be selected. Consideration should be given to uniformity of size, smoothness, fleshiness, colour, sweetness, freedom from cracking, and texture of skin. Some strains of tomatoes produce fruits with very little flesh and a great amount of juice. This characteristic should be eliminated. It is better to select plants showing whole trusses of uniform fruit than plants with isolated fruits of good quality but carrying mainly uneven or inferior fruits.

Fruits should be allowed to ripen until they are past edible condition but before they decay. Seed may be extracted by cutting the fruits transversely and then squeezing the pulp into a glass or earthenware container. After a small quantity of water has been added, the pulp can be allowed to ferment for 24 hours. Frequent stirring will assist in separating the seed from the flesh. After 24 hours more water should be added and the mixture stirred vigorously and then allowed to settle. The water and pulp can then be poured off carefully. By repeating this operation several times it is possible to extract a fairly clean line of seed.

There are several other methods of seed extraction, one of which includes the use of hydrochloric acid. However, the only other suitable method for the home gardener is somewhat similar to that described. Freshly extracted pulp is folded into a square of coarse muslin or similar material, which is worked vigorously with the fingers under water. It is possible by this method to force the flesh through the cloth and clean the seed in one operation.

When the seed is clean it should be spread thinly on sheets of paper and dried in an airy place away from direct sunlight. Frequent stirring will permit the seed to dry evenly and thoroughly on all sides. When dry the seed can be bagged.

Pumpkins, Squashes, Marrows, Cucumbers

As pumpkins and squashes are usually allowed to mature before being harvested, seed saving is relatively easy, as seed can be extracted when the vegetables are prepared for the table. Cucumbers and marrows, however, must be allowed to mature well before seed is extracted.

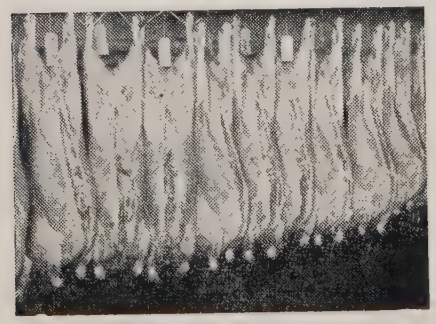
Consideration should be given to ability to stand hot, dry conditions when plants of these vegetables are being selected. Long, slender, straight, and dark green cucumbers are desirable and as with other vegetables cropping capacity is important. Thickness and crispness of flesh are two other desirable characteristics. It is said that a heavier set of cucumber seed will develop if the first few fruits are cut off the vines when they reach a desirable size. Later fruits usually produce more seed.

Pumpkins and squashes should be selected primarily for keeping quality. Vines showing all the favourable characteristics should be selected, and from those the best fruits should be taken. Fruits should have the desirable shape for their type and should be heavy for their size. Heaviness should denote thick, firm flesh and hard bark. Squashes with deep orange-coloured and crinkled bark are considered the most desirable types.

DOUBLE TRIUMPH for

ELASTRATOR CASTRATION AND TAILING

at the Marlborough A. & P. Association, Picton.



1st PRIZE on the hoof

. . . to Mr. M. D. Campbell, Marlborough, enthusiastic Elastrator user for 4 seasons. He finds Elastrator rubber ring method easy, clean, safe . . . has operated on more than 1,200 lambs and lost only ONE. Says Elastrator gives first-class results . . . proves it with champion stock.

1st PRIZE on the hooks

. . . to Mr. T. P. Murphy of Spring Creek, another consistent Elastrator user who acclaims the advantages of this bloodless method of castration and tailing . . . and who shares in Elastrator's Double triumph.

Follow their lead. Next season, for better stock, use the

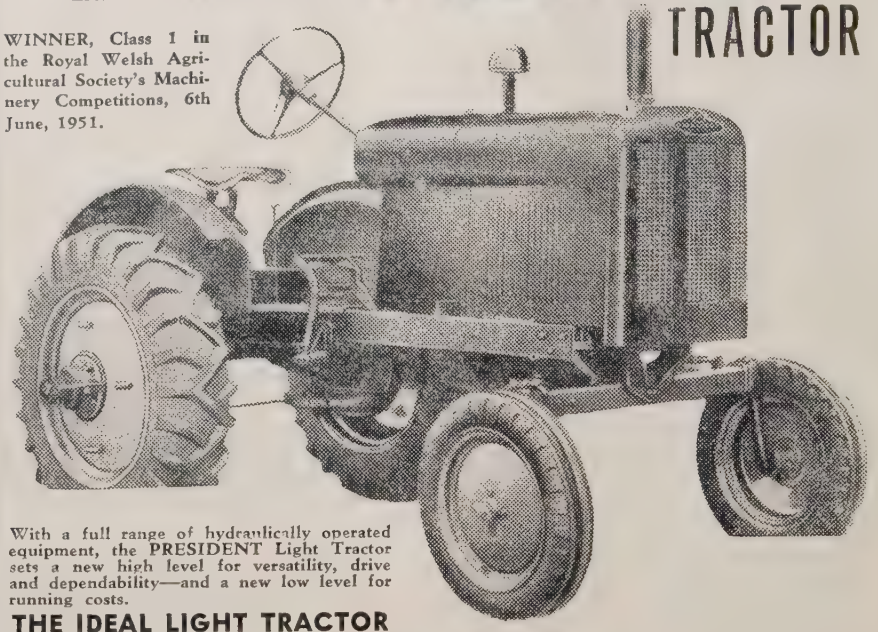
ELASTRATOR

Bloodless Rubber Ring Method of Castration and Tailing

Elastrator Co. Ltd., Box 266, Blenheim.

SLASH FARMING COSTS WITH THE NEW BRITISH B·M·B PRESIDENT TRACTOR

WINNER, Class 1 in the Royal Welsh Agricultural Society's Machinery Competitions, 6th June, 1951.



With a full range of hydraulically operated equipment, the PRESIDENT Light Tractor sets a new high level for versatility, drive and dependability—and a new low level for running costs.

THE IDEAL LIGHT TRACTOR

Dealers in all Main Centres.

N.Z. Distributors: AGRICULTURAL CULTIVATORS (N.Z.) LTD., P.O. Box 1102, Auckland.

SHEEP BLOWFLY CONTROL NEW METHODS

Cooper scientists, after many years research with the two most outstanding fly insecticides, D.D.T. and "Gammexane", have produced preparations for both TREATMENT and PREVENTION of strike. Thus, at last, practical methods are at hand for dealing with a pest that is responsible for such great economic loss.

PREVENTION

COOPER'S POWDER FLY SPRAY and DIP

(Containing D.D.T. and "Gammexane")

A new and highly effective powder preparation providing 5-6 weeks' protection from strike with one spraying. It should be used at the onset of a fly wave or better still, systematic sprayings undertaken each year at a time immediately prior to the date at which fly is normally expected. Five 2lb. packets make 100 gallons of spray which should be sufficient for upwards of 400 sheep. Bucket pumps or power units can be used.

TREATMENT

COOPER'S MAGGOT DRESSING

(Also containing D.D.T. & "Gammexane")

An entirely new type of product for treatment of struck sheep. This dressing has advantages not possessed by any other, the chief being that *it expels maggots from the fleece instead of leaving putrefying bodies to attract further flies.* Moreover Cooper's Maggot Dressing protects the wound against re-strike and assists healing. Does not irritate the skin or stain the fleece. (1 part Dressing to 19 parts water.) Gallon drums and 16oz. tins.

BOTH THESE PRODUCTS WILL BE AVAILABLE FROM STOCK AND STATION AGENTS AND MERCHANTS

COOPER, McDOUGALL & ROBERTSON (N.Z.) LTD.

BOX 599 - - - - - AUCKLAND

Method of cutting open tomatoes (left) and of extracting the pulp (right).

Marrows should be selected for keeping quality if it is desired to store them for winter use. Heaviness in individual fruits should denote a good thick skin and firm flesh.

The flesh of pumpkins, squashes, and marrows can be tested for flavour when it is cooked. The seed from the most desirable types can then be saved. Several washings with water will remove most of the flesh from the seeds, which can then be spread out in the sunshine to dry. The germination of these seeds can be affected if they are subject to frost or even chilly conditions. Seed can be bagged when thoroughly dry.

Parsnips, Carrots, Beetroot, and Turnips

As parsnips, carrots, beetroot, and turnips are biennials, they must be grown for two seasons before seed can be produced. Selection of roots should be made from the main crops when they are full grown. Roots should be lifted carefully, and when selections are made for replanting uniformity in size and shape should be considered. Desirable characteristics of carrots also include a small core, good colour, crispness or tenderness, and good flavour. As it will not be possible to test for the desired internal qualities roots set aside, several very similar roots can be selected and one or two cut for close inspection. This would apply also in some respects to the other types of root crops. Gardeners may also wish to select carrots and parsnips with distinct stump roots instead of tapered roots. Stump roots are more economical from the culinary point of view, but they may be difficult to grow as main crops if soil conditions are dry during summer.

After the roots have been selected their tops should be removed, except for the basal 2 or 3in. This will prevent injury to the central bud. Roots can then be stored for the winter in a box of dry sand or soil or in a pit lined with straw or sacking in a dry part of the garden.

In spring the roots should be set out about 30in. apart in exactly the way in which they grew the previous season. As the seed stalks develop staking will be necessary.

Turnip seed should be harvested as soon as the pods turn yellow. If the stalk is cut at this stage and in the early morning, much loss of seed through shattering will be prevented. Parsnip, carrot, and beetroot can be safely left until fully mature, but care should be taken to harvest the seed before it drops. Progressive collection of ripe parts of seed heads may be advisable, as ripening of complete heads is rather patchy.

Threshing is best done by pulling the seed from the stalks, placing it in a strong cloth bag, and beating the bag with a heavy stick. The fine stalks and other rubbish can then be winnowed from the seed, which should be spread out to dry thoroughly before being stored.

Cabbages

Cabbage seed is produced in many ways. Plants or parts of them must be over-wintered for planting out the following spring. Some seed growers save only the stump of the plant and others store the head with part of the stump. These are planted out in spring and proceed to produce seed stalks from the cabbage head. A third method is to plant out crops so late that they do not mature before winter. The plants over-winter in the garden and in spring mature and throw out seed heads. This last method and the stump method are the most satisfactory for home gardeners.

Cabbages should be selected for desirable characteristics as they mature, after which the stumps can be saved or the plants left to over-winter in the garden. Desirable points include uniformity of type, weight of head, and length of time to mature.

The seed stalks of brassicas are best staked as they develop to prevent damage by wind. As brassica seed pods shatter very easily, harvesting should begin when the pods turn yellow. The seed heads can then be spread on paper in a dry, airy place to ripen. A light beating, if necessary, will cause the pods to shatter. The seed should be allowed to become entirely ripe and hard before being stored.

Onions

Onion bulbs should be selected from the main crop of plants grown for domestic purposes. As normally a large number of plants is grown, a good selection can be made. Bulbs should be selected for shape, appearance, and storage quality. Flavour is also important, but is difficult to assess when the bulb itself must be saved for seed production. A narrow neck usually denotes the presence of one seed stalk. This type is the most desirable for seed production and also for storage, as the narrow neck closes well and tends to exclude storage-rot organisms.

Onions should be well matured before storage for winter. In early spring they should be set out with about a third to one quarter of their depth in the soil. The seed stalk must be staked as it grows, otherwise the whole plant may topple over. As onion seed turns black before it is ripe, care must be taken to allow it to ripen properly, but it should be harvested progressively before it starts to fall. Seed stalks should be cut about 1ft. below the seed head and placed in shallow, paper-lined trays. Trays should be placed in sunshine until the seed is properly ripe. Seed should then be rubbed out, winnowed, and bagged.

Lettuce

Lettuce seed can be produced in 1 year if plants are set out as early as possible. Tenderness, flavour, uniformity, speed of growth, tightness of head, and ability to stand dry, hot conditions are characteristics which should be sought.

When plants have been selected it is advisable to cut surrounding plants as quickly as possible to give selected ones room to develop. If the heads are very tight, it may be necessary to cut the tops carefully to allow the seed stalks to push through. Lettuce seed matures slowly and somewhat unevenly; therefore a close watch should be kept on the first seed heads to open. Then the whole plant should be pulled up, the seed head inserted in a paper bag, and the whole plant hung up in a dry, airy place until the seed is fully ripe. Threshing, sifting, and winnowing will give a good, clean product.

FERTILIZER IS PRECIOUS

Can you afford to waste it?

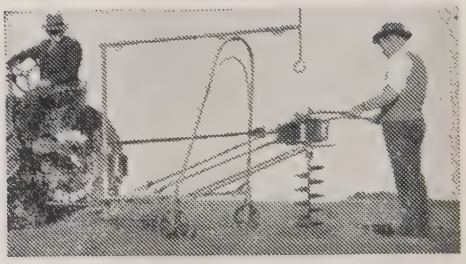
There is no leakage or sifting with Multiwall Paper Bags; and not one bit of the Fertilizer is left clinging to the walls.
The flick of a knife and the Bag is open; a quick tip and the bag is empty—with the minimum of effort, time and dust.
Several walls of stout Kraft paper make Multiwall Paper Bags ruggedly robust.
Multiwall Paper Bags are easy to carry, they stack easily, in less space, and leave no gaps for rodents to nest in. You get the fertilizer free from lumps and in perfect condition.
Multiwall Paper Bags, being lower in price, have helped substantially in keeping your Fertilizer prices down.

It will obviously pay you to
BUY YOUR FERTILIZER IN

MULTIWALL

PAPER BAGS

Manufactured to Bates St. Regis specifications.
Address all enquiries to the Manufacturers:
N.Z. FOREST PRODUCTS LTD.
(Multiwall Bag Division),
PENROSE - - - - - - - - AUCKLAND



POSTHOLE **HALLIDAY** DIGGER

POST HOLE DIGGER digs up to 80 post holes an hour

Easily attached to all tractors. Highly manoeuvrable, moves in any direction, on banks, hilltops or level ground, independent of power source.

Bores 10 inch in diameter and up to 2ft. 9in. depth with standard auger.

HUNDREDS SOLD THROUGHOUT NEW ZEALAND!
N.Z. Patent 89076. Australian Patent 137792.

SEND FOR FREE FOLDER

AGENTS: Southland Farmers' Co-op Association., Ltd., Invercargill and Gore. Reid & Gray, Balclutha. Wright Stephenson & Co. Ltd., Dunedin and Oamaru. Washdyke Implements Ltd., Timaru. Skillings Implements Ltd., Christchurch. Levin & Co. Ltd., Blenheim. Manawatu Machinery Exchange Co. Ltd., Palmerston North. Farmers Co-op Auctioneering Co. Ltd., Hamilton. J. B. MacEwan & Co. Ltd., New Plymouth. Alfred Buckland & Co. Ltd., Auckland. Bull & Hodgins Ltd., Hastings. Dannevirke Machinery Co. Ltd., Dannevirke.

THE N.Z. DISTRIBUTOR,
"Halliday" Post Hole Digger.
MR. E. HALLIDAY,
R.D. Edendale, Southland.

Please send free folder with details of the "Halliday" Post Hole Digger.

NAME.....

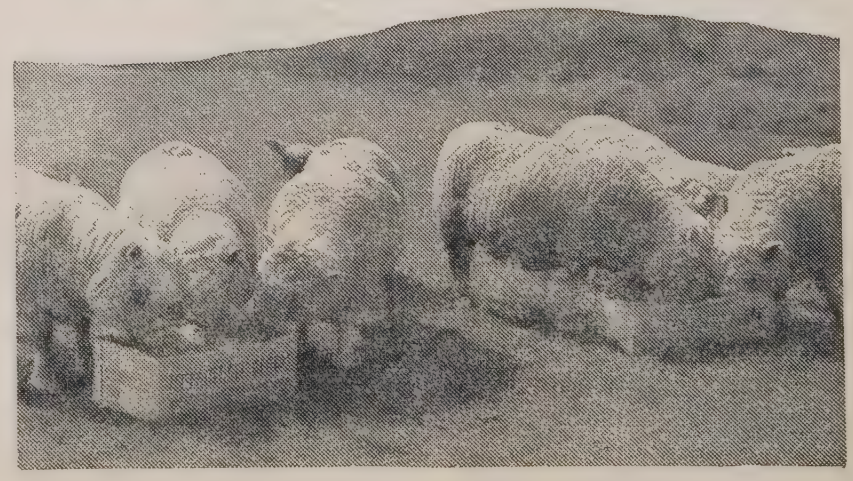
ADDRESS.....

.....

.....

J.A.

To grow more wool . . .



put MOLACTRATE Proteinised Molasses Block out in the paddock . . .

Your sheep do the rest. Molactrate Proteinised Molasses Block is 15% wool growing protein. It's Molasses plus protein in solid form.

Order From Your Produce Merchant

the stock food that feeds itself

If seed heads of any vegetables are isolated from insects by enclosing the heads in bags, the importance of harvesting the seed before it falls is not so great. The bags, if securely tied to the seed stalks, will catch any seed that may fall. This method will ensure properly matured seed and will tend to give a higher percentage of germination than the method of pulling plants as soon as some seed is ripe. All maturing seed heads, whether bagged or not, should be sheltered from rain. If the seed becomes wet and mouldy, germination capacity will be reduced.

Storage

All varieties of vegetable seeds before being stored should be clearly labelled, especially if a seed-selection programme over a number of years is contemplated. Cloth bags make the best containers for storage; alternatively, paper bags or even envelopes are satisfactory. Most seeds deteriorate if stored in moist or hot conditions. A dry, well-ventilated room or shed is best. Seed should be protected against vermin such as rats and mice by storing bags in dry tins of a suitable size. If cured and stored correctly, most seeds will remain viable for a number of years, the period varying with the vegetable. For example, bean, leek, onion, parsnip, and pea seed should remain viable from 1 to 3 years, beet, cabbage, cauliflower, carrot, lettuce, radish, tomato, turnip, pumpkin, and squash seed for from 4 to 6 years, and cucumber seed for up to 10 years.

Work for February

Gardeners should have little reason for going further than their own vegetable plots for the wide variety of vegetables that are harvested this month. Early-planted crops will be finished or nearly so and sowings of crops for winter or spring use should be made.

Globe artichokes: The flower heads of this unusual vegetable should be kept cut as they develop. This will encourage development of further heads, as will the addition of water if the weather is dry.

Cabbages: Sowings of spring cabbage should now be made in areas south of the middle of the North Island. These can be planted out later in land recently cleared of crops such as onions or peas. Flower of Spring, Offenham, and Enfield Market are good, reliable varieties. In the north, where conditions are more favourable, drumhead types can be sown. Raised seed-beds should not be used, as they tend to dry out and at this time of year excessive dryness will tend to reduce germination.

Cauliflowers: Seedlings of early types should be planted out this month and seed of varieties such as Phenomenal (5 months), All the Year Round, and Best of All may be sown. From germination onward, cauliflowers should not receive any check. They are one of the most sensitive of vegetables and any check may result in poor curd production.

Lettuce: Seed of varieties Imperial 615, Neapolitan, and Great Lakes can be sown during February for autumn production. If the seed is sown thinly in rows where the plants are to grow, plants will come away quickly without check. Lettuce plants, like most other leaf vegetables, must be grown fairly quickly if they are to be of good quality. A steady supply of moisture in soil rich in organic matter will give the best results. Applications of liquid manure or nitrate of soda, 1oz. to 4 gallons of water, will benefit plants as they begin to heart.

[*Sparrow Industrial Pictures Ltd photo.*

Carrots such as those shown here should be reselected to eliminate those that are off-type before roots are set aside for seed production.

Tomatoes: Pickings of tomatoes should be made as the fruit matures, and before birds and other pests or diseases spoil the fruit. If the plants have been supplied with adequate moisture, they will make abundant growth, and pruning and tying of plants will be necessary. If the foliage is dense, a little foliage can be removed from about fruit trusses to allow the fruits to mature fully in the increased light. Spraying with Bordeaux mixture for the control of fungous diseases and with arsenate of lead for control of caterpillars may be necessary.

Marrows, pumpkins, squashes, and cucumbers: These crops will require watering if the soil is dry. Marrows and cucumbers should be cut as they mature to encourage development of further fruits. Pumpkins and squashes (and marrows if desired) for winter storage should be fully mature before being cut. If aphides are prevalent, these crops should be sprayed with nicotine sulphate and soft soap or an H.E.T.P. (hexaethyl tetraphosphate) preparation. These two products should be handled with caution, as they can be dangerous to those using them.

Onions: Some crops of onions will now be reaching maturity, and proper ripening is essential if they are to be stored successfully. As soon as the tops begin to turn colour and feel limp they can be bent over to hasten ripening. Onions should be ripened well and stored only when the roots have become thin and wiry. Bulbs suitable for storage should be firm and sound, with an unbroken skin of a good rich colour, and have narrow necks. If the weather is wet, bulbs should not be left on the ground or outside, because exposure to wet weather will impair their keeping quality.

Silver beet and spinach beet: These vegetables are looked upon by some as the "black sheep" of the vegetable family, but a row or two in the garden will provide greens when almost no other fresh vegetables are available. Sowings now will give spring crops in most districts, although in districts with very favourable autumn and winter conditions sowings can be delayed. Fordhook Giant and Large Ribbed Dark Green are popular varieties of silver beet and Perpetual Spinach of spinach beet.

Maintenance

Vacant plots should be dug over and cover crops of peas, mustard, lupins, or cereals sown. Weeds should be kept down by constant cultivation. If watering is necessary, adequate supplies should be given at intervals in preference to frequent sprinklings.

A watch must be kept for diseases and pests, particularly for evidence of late blight on potatoes.

Runners of kumaras should be lifted occasionally to prevent them from taking root.

A last planting of celery should be made.

Peas and beans should be picked frequently to prolong their harvest period.

Shallow-rooted plants such as peas, beans, and tomatoes will benefit from a mulch if conditions are dry and hot. The soil should be watered before the mulch is applied.

A sowing of parsley for winter and spring use should be made. Mustard, cress, and radish for late-summer and autumn use can be sown in a damp spot.

A small sowing of quick-maturing, stump-rooted carrots can still be made in districts with favourable autumn conditions.

Potatoes should be dug early in the day and dried off so that they can be collected before nightfall. Diseased, damaged, or worm-eaten tubers should not be mixed with those set aside for winter use.

In the north a final sowing of beetroot can be made.

Class Leaders under Certificate-of-Record Test at the End of 1950

Class	Name of cow	Tested by	Age Years	Age Days	Standard (lb.)	Days	Milk (lb.)	Fat (lb.)
JERSEYS—YEARLY (365-DAY) DIVISION								
Junior 2-year-old	Beechlands Summer Lass	A. Moreland and Sons, Te Rapa	1	343	275.5	365	15,467.2	899.25
Senior 2-year-old	Ashvale Dreaming Stella	J. and G. W. Dobson, Lepperton	2	350	310.5	365	12,689.1	815.73
3-year-old	Ivondale Silver Rainbow	P. J. Petersen, Waitara	3	327	309.7	365	15,073.4	950.63
4-year-old	Woodlands Felicie	P. J. Petersen, Waitara	4	364	384.9	365	17,332.6	1,220.89
Mature	Holly Oak Annie	W. T. Williams, Pukehou	5	9	350.0	365	18,522.7	1,056.49
JERSEYS—305-DAY DIVISION								
Junior 2-year-old	Springdale Flower Girl	R. Campbell, Hamilton	1	346	250.5	305	10,199.6	651.35
Senior 2-year-old	Ashvale Dreaming Stella	J. and G. W. Dobson, Lepperton	2	350	285.5	305	11,317.8	711.51
3-year-old	Horowhenua Lady Acora	W. G. Gust, Rongotea	3	353	322.3	305	15,175.4	906.94
4-year-old	Alven P. B. Queenlike	S. R. and A. E. D. Hughes, Waharoa	4	33	326.8	305	12,775.3	746.60
Mature	Cyrilla's Twylish Girl	E. J. Clough, Inglewood	11	88	360.0	305	17,645.4	906.15
FRIESIANS—YEARLY (365-DAY) DIVISION								
Junior 2-year-old	Oakview Keyes Trojan	A. W. Montgomerie, Mangere	2	131	288.6	365	22,146.8	836.98
Senior 2-year-old	Pareora Echo Blossom	T. Sheriff, Clandeboye	2	223	262.8	365	22,671.9	819.81
Junior 3-year-old	Tararua Aurora Australis	E. P. McAnulty, Eketahuna	3	1	312.1	365	21,715.7	846.75
Senior 3-year-old	Totara C. R. Buttercup	Piri Land Co., Taupiri	3	247	336.7	365	25,885.3	989.10
Junior 4-year-old	Totara Veeman Lulu	Piri Land Co., Taupiri	4	12	349.7	365	22,364.2	946.78
Senior 4-year-old	Totara C. R. Buttercup	Piri Land Co., Taupiri	4	267	375.2	365	27,108.1	1,079.14
Mature	Lauderdale Regina Primrose	Fiecken Brothers, Tai Tapu	6	233	385.0	365	32,639.3	1,201.88
FRIESIANS—305-DAY DIVISION								
Junior 2-year-old	Waimate R. N. Nannette	C. N. Radford, Belfast	2	138	264.3	305	14,145.3	554.77
Senior 2-year-old	Weir Bank A. P. Sylvia Midget	McHattie Brothers, Outram	2	332	283.7	305	13,240.6	565.56
Junior 3-year-old	Pinevale Butterboy Lola	S. R. Wells, Wakefield	3	177	304.7	305	16,195.4	586.97
Senior 3-year-old	Okains Nickel	R. G. McIntosh Paeroa	3	335	320.5	305	19,968.6	592.76
Junior 4-year-old	Lelburne Madeline Domino	A. and R. Udy, Menzies Ferry	4	72	330.7	305	16,594.6	687.72
Senior 4-year-old	Fairburn Lady Taureau	W. C. Miller, Motukarara	4	246	348.1	305	14,846.1	592.17
Mature	Hiwiroa Nancy Princess	G. G. McRae, Waimate	8	5	360.0	305	20,647.6	761.25
MILKING SHORTHORNS—YEARLY (365-DAY) DIVISION								
Junior 2-year-old	Matangi Quality 4th	Ranstead Brothers, Matangi	2	109	251.4	365	14,572.8	591.89
Senior 2-year-old	Kereone Nora 3rd	R. D. Cochrane, Kereone	2	307	306.2	365	14,406.1	650.21
Junior 3-year-old	Matangi Quality 4th	Ranstead Brothers, Matangi	3	153	292.3	365	16,281.4	678.02
Senior 3-year-old	Matangi Ruth 2nd	Ranstead Brothers, Matangi	3	304	307.4	365	14,032.7	747.86
Junior 4-year-old	Kereone Blossom 4th	R. D. Cochrane and Son, Kereone	4	23	350.8	339	15,841.3	635.12
Senior 4-year-old	Ashley Bank Winsome	Peach Brothers, Sefton	4	298	378.3	365	17,687.7	730.93
Mature	Glenthorpe Lady	A. J. Melville, Buckland	Mature		350.0	365	20,136.2	856.85
MILKING SHORTHORNS—305-DAY DIVISION								
Junior 2-year-old	Wilford Grove Eugenie	Miss R. Arnold, Waimea West	2	15	252.0	305	8,933.8	402.15
Senior 2-year-old	Wilford Grove Beulah	Miss R. Arnold, Waimea West	2	322	282.7	305	8,969.9	451.38
Junior 3-year-old	Haeremai Sultana	G. H. B. Lill, Willowby	3	335	320.5	305	10,868.9	490.21
Senior 3-year-old	Haeremai Sweet Pea	G. H. B. Lill, Willowby	3	349	321.9	305	9,368.4	438.49
Junior 4-year-old	Haeremai Snowy 4th	G. H. B. Lill, Willowby	4	18	325.3	305	11,953.3	600.56
Senior 4-year-old	Wilford Grove Beulah	Miss R. Arnold, Waimea West	4	310	354.5	305	10,128.5	481.68
Mature	Wilford Grove Beulah	Miss R. Arnold, Waimea West	5	321	360.0	305	12,050.9	610.98
AYRSHIRES—YEARLY (365-DAY) DIVISION								
2-year-old	Fair Maid of Greenbank	W. Moore, Homebush	2	27	243.2	365	12,281.3	673.56
3-year-old	Maesgwyn Victoria	C. M. Williams, Kaiapoi	3	250	302.5	365	16,507.7	646.98
4-year-old	Ivanhoe Fancy	A. M. Weir, Menzies Ferry	4	308	344.3	365	14,207.7	713.93
Mature	Floss of Braeside	W. Moore, Homebush	7	287	350.0	365	20,305.5	832.72
AYRSHIRES—305-DAY DIVISION								
2-year-old	Greenfields Fashion	C. E. C. Webb, Levin	2	109	261.4	305	9,501.2	504.78
3-year-old	Greenfields Fashion	C. E. C. Webb, Levin	3	97	296.7	305	12,916.8	623.82
4-year-old	Swancote Dorothy	Browne Brothers, Kaitoke	4	89	332.4	305	10,023.7	454.45
Mature	Heathercrest Lady Choysa	W. Taylor, Stratford	7	360	360.0	284	12,977.7	694.39

Cows Issued with Certificates to the End of 1950

Breed	First class		Second class		Totals		
	Yearly	305-day	Yearly	305-day	Yearly	305-day	Both divisions
Jersey	12,258	3,609	1,713	509	13,971	4,118	18,089
Friesian	2,361	288	370	68	2,731	356	3,087
Milking Shorthorn	561	61	54	17	615	78	693
Ayrshire	248	57	10	2	258	59	317
Totals	15,428	4,015	2,147	596	17,575	4,611	22,186

Numbers of Breeders and of Pedigree Cows on Test

Season	Breeders	C.O.R. cows	O.H.T. cows	Total cows
1946–47	597	1,490	8,113	9,603
1947–48	659	1,454	9,859	11,313
1948–49	714	1,336	13,151	14,487
1949–50	753	1,131	15,294	16,425
1950–51	785	956	17,398	18,354
Totals	3,508	6,367	63,815	70,182

Review of Government Herd Recording

Contributed by the Dairy Division

AFTER having introduced systematic cow testing and sponsored its development since its inception, the Government withdrew from active participation in this work at 31 July 1951, from which date the New Zealand Dairy Board assumed responsibility for the administration of the herd-recording services of the Dominion. Thus ended a continuous supervisory association dating from the 1890's, when experiments in the testing of whole herds by the Babcock test were carried out by a Government Dairy Instructor, and from 1909, when the Department of Agriculture introduced the systematic testing of dairy herds on a district or "association" basis.

[*"New Zealand Farmer" photo.*
Horowhenua Lady Acora, tested by W. G. Gust, Rongotea, has the highest 305-day C.O.R. record for all breeds of 906.94lb. of fat at the age of 3 years and 353 days. She also has a C.O.R. 365-day record of 1065.36lb. of fat as a 4-year-old.

TO foster the district system the Department conducted free of cost a number of what were termed illustration associations to show dairy farmers how the work could be done and to educate them in the value and importance of herd testing. The first association was organised at Dalefield, in the Wairarapa, and during succeeding years the movement was extended from district to district until almost every dairy-farming district of any importance was catered for, from Whangarei in the north to Stirling in the south. The association system, under which the owner takes his own milk weights and samples, was used mainly because it is economical and cheap, and it was quite satisfactory when dairy farmers were concentrating on herd building and were little interested in the selling of dairy stock.

Certificate-of-Record Test

The introduction of the Certificate-of-Record test in 1912 marked the beginning of a special service for breeders of pedigree dairy cattle. In addition to providing an authentic record of production, it drew attention to the special advantages of using a pedigree herd sire and a pedigree foundation dam in herd improvement. In time the C.O.R. system was developed to a high standard of reliability and went much further than the association system, as it provided for, among other things, a record of the daily milk weights of each cow on test, the checking of milk yields and taking of samples by an independent person, and a check on dates of calving. The costs of the C.O.R. test were necessarily high. It entailed much recording work for the herd owner and it was principally an individual cow test.

Official Herd Test

The Government Official Herd Test (O.H.T.), introduced in 1927 as an adjunct of the C.O.R. test, was a simplified C.O.R. test and completed the testing requirements of pedigree breeders. It retained the more important authenticity safeguards of the C.O.R. system, but relieved the owner of recording the daily milk weights and also dispensed with calving qualifications.

The O.H.T. was primarily intended for a herd test. Breeders were recommended to use it for this purpose, which the low fees were designed to encourage. However, most breeders persisted in using it as an individual cow test, and only in the last few years, when other factors began to operate, was there any real trend toward the entry of whole herds under O.H.T. by pedigree breeders.

Summary of Results

For many years annual summaries of C.O.R. results were published in "The Journal of Agriculture" in considerable detail. Staffing difficulties forced the abandonment of the preparation of these summaries some years ago, and even now it has not been possible to complete them year by year for past years. However, breeders have received certificates for all cows that have qualified, and a copy of each certificate has been supplied to the breeders' association concerned. In addition, breeders' associations have received each year production summaries under age classes, particulars of class leaders, and other details, and have publicised them. The Friesian and Jersey Associations issue them annually in booklet form.

The previous C.O.R. summary was published in the "Journal" for November and December 1944 and covered results for 1941, 1942, and 1943. The tables on this and the opposite pages summarise the more important results of the intervening years, and with comparable tables previously published constitute a general survey from the beginning of C.O.R. testing to the end of 1950.

[*Green and Hahn Photography Ltd. photo.*
Lauderdale Regina Primrose, tested by Fiecken Brothers, Tai Tapu, has the highest C.O.R. figure for a Friesian of 1201.88lb. of fat in 365 days as a mature cow.

First-class Certificates Issued to the End of 1950

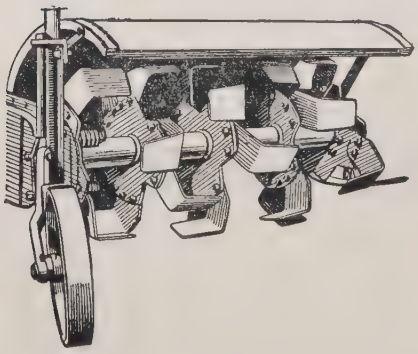
Breed	Totals to 31/12/43	1944	1945	1946	1947	1948	1949	1950	Totals to 31/12/50
YEARLY (365-DAY) DIVISION									
Jersey	10,880	431	432	418	554	392	264	222	13,593
Friesian	2,581	31	48	40	53	52	38	48	2,891
Milking Shorthorn	572	3	2	9	9	7	11	7	620
Ayrshire	262	4	2	2	3	1	2	1	277
Totals ..	14,295	469	484	469	619	452	315	278	17,381
305-DAY DIVISION									
Jersey	983	177	274	323	524	530	575	489	3,875
Friesian	80	15	24	14	39	42	45	45	304
Milking Shorthorn	19	7	12	4	10	7	4	11	74
Ayrshire	10	5	4	5	6	6	13	14	63
Totals ..	1,092	204	314	346	579	535	637	559	4,316

THERE'S A

ROTAVATOR

TO FIT
YOUR TRACTOR!

DAVID BROWN, FERGUSON, FORDSON MAJOR, NUFFIELD UNIVERSAL and other tractor makes



. . . **ENGINE POWERED** Blades that bring your land into profit—faster!

COMPLETE cultivation with one implement —powered by your tractor's engine! That's "rotavation" . . . a labour-saving, money-saving improvement in mechanised farming. "Rotavation" by **ROTAVATOR** aerates the soil . . . aids fertility . . . produces a perfect seed-bed.

ROTAVATOR'S self-sharpening blades whirl swiftly and powerfully to clean stubble as you go and cut and mix weeds into the soil for useful green manure. You'll speed sowing, grow better crops, make more profits the very first season you prepare your land the **ROTAVATOR** way. Make "rotavation" pay This season. Operate a new **ROTAVATOR** from Your tractor!

Rotavators are entirely made in England by Rotary Hoes Ltd. — largest manufacturers and exporters of rotary hoes in the British Commonwealth. Be sure you get a genuine Rotavator.

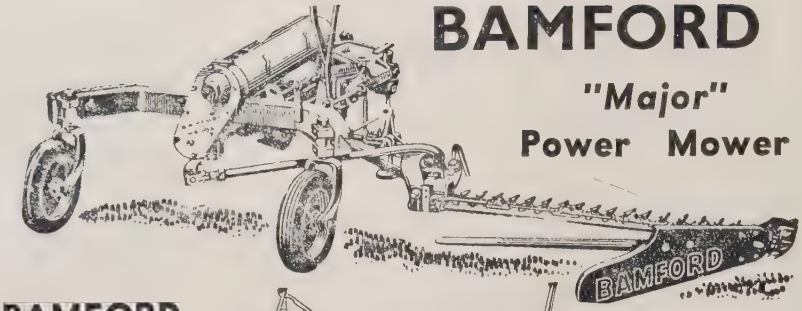
See your tractor Dealer or Write:—

ROTAVATORS LTD.,
Box 243 - - - Wellington.

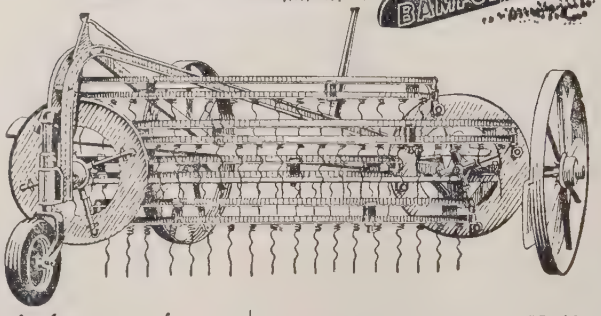
Outstanding Value!

BAMFORD

"Major"
Power Mower



BAMFORD
Side Rake
And
Tedder



Obtain full particulars now, from—

REID & GRAY LTD.

Head Office & Works: BURNSIDE, OTAGO.
Branches at Invercargill, Gore, Balclutha.

Agents: Gisborne: Tractor & Machinery Co. Ltd.; Palmerston North: Reid & Gray Agency Co. Ltd.; Taranaki: Newton King Ltd.; Masterton & Nelson: Levin & Co. Ltd.; Blenheim: R. Cresswell & Sons Ltd.; Greymouth: Greymouth Motors Ltd.; Christchurch, Ashburton, Timaru, Waimate, and Oamaru: National Mortgage & Agency Co. of N.Z. Ltd.

INVEST IN

KIWI

SHEEP SHEARING MACHINES

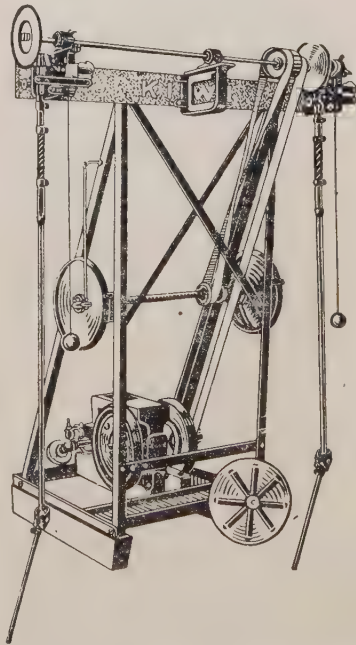


Illustration shows the "KIWI" Portable Model.

Also available:
"Electric", "Standard" and "Midget" Models.

Write for further details.

NEW KIWI SHEEP SHEARING MACHINE CO. LTD

90 Federal Street - - - - - - - - - - Auckland

Establishing a Household Poultry Unit

By the Livestock Division

EGGS, like vegetables, are at their best when fresh, but other factors influence a householder when he considers whether to keep fowls. The price of eggs and the prospect of a regular supply during winter are perhaps the two most important. In addition, the householder who is a keen gardener knows that poultry manure is a valuable organic fertiliser, and the litter or bedding from the poultry house makes splendid compost. Results will be best when the householder has consistent regard for the birds and looks on poultry keeping as an interesting hobby. Less successful will be the man who seeks only what he can get out of his birds with the minimum of attention.

THE knowledge required to keep fowls on a small scale is not great, but such knowledge of management as is essential should be thoroughly understood and consistently applied. Failure to obtain a reasonable supply of eggs is often caused by a lack of information about the simple rules of management.

Production of eggs in spring and summer is comparatively easy, but winter eggs are more valuable and a more welcome addition to the family diet. It is natural for fowls to lay in spring and summer and they will do so with a minimum of reasonable attention, but winter production is not entirely natural and will be obtained only under good housing conditions backed by careful management and correct feeding. During winter the householder must give his birds the maximum of attention.

Birds require attention every day and more than once a day. They cannot be allowed to fend for themselves at the weekends if production is to be maintained.

Reminders for February

Hot weather means thirsty birds. They require an ample supply of cold water. Water troughs should not be exposed to direct sunshine.

Hot weather is ideal for lice. Examine birds for lice and, if they are present, use nicotine sulphate on the perches at night.

All birds should be in lay. Discard any birds that go into an early moult during February, as they are likely to be poor producers and unsuitable for retention for another laying season.

If an order for the new season's pullets has not been placed, it is already late and no further delay should be permitted.

Owners who have taken delivery of growing pullets will be well advised to dose each bird with a 1 c.c. capsule of carbon tetrachloride to clear it of roundworms. This should be a routine precaution, not to be delayed until worms are seen in the droppings or until the pullets look anaemic.

Young pullets which arrive in February should not be put in the house with the older laying birds. The hens bully the pullets and drive them away from the food trough, and the young birds' growth and development are thus retarded.

Rats are readily attracted to poultry food, but reasonable care reduces this trouble to a minimum. Uncovered food must not be left in the laying shed at night, and a rat-proof place in which to store both grain and mash is highly desirable. The feeding of too much grain in the litter, particularly for the evening meal, results in rats being attracted by the uneaten portion.

Keeping fowls at home is not a cheap hobby at present, but, properly managed and with reasonable production, they can be made to pay and to effect a substantial saving in the household accounts. Eggs surplus to household requirements can be sold, and when fowls have finished laying they have a market value or can be used as table birds, thus offsetting part of the price of replacements.

Establishment and Production Costs

Growing pullets bought before the beginning of a new laying season are costly—between 8s. 6d. and £1 each according to their age. Grain and mash are expensive, particularly for the owner of a few birds who buys poultry foods in small quantities at the maximum price permitted. However, feeding costs can be lowered by the judicious use of household scraps, but the old idea that fowls can be fed successfully on a little grain, pollard, bran, and some scraps is erroneous. Feeding a laying bird costs the commercial poultry producer about £1 per year, and this figure may well apply to the backyard hen.

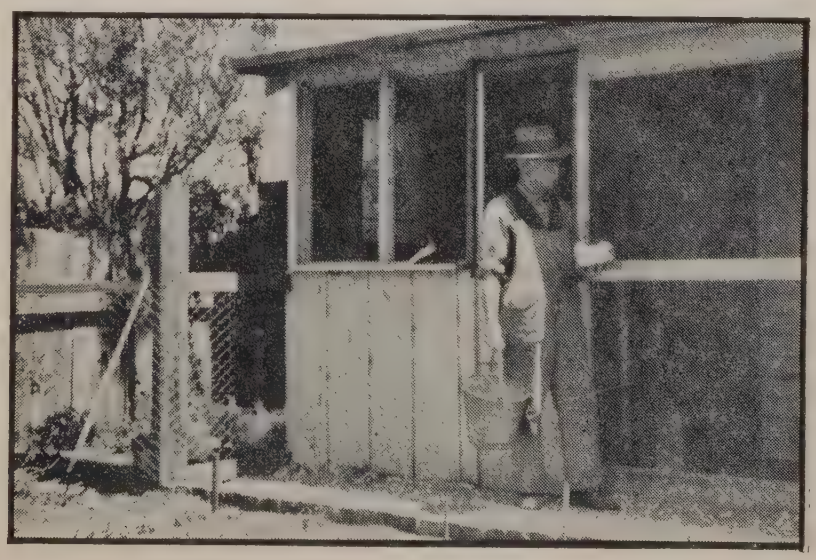
A SERIES of articles about household poultry published during the past 2 years has been much appreciated by people who run only enough laying birds to keep the family in eggs. This is the first of a new series, and the intention is to introduce further advice for those who wish to start a small household unit, while at the same time supplying additional information for those already looking after laying birds.

Many household poultry keepers have no idea or only a vague idea of their egg-production costs. If a laying bird produces only 10 dozen eggs per year, worth on average, say, 3s. per dozen, all outgoings are fully covered. Some of the costs which the commercial producer must face do not appear on the debit side of any accounts or costings noted by the householder, which may cause him to think poultry keeping most attractive and to consider taking up poultry farming, but the profits for the householder are no guide to the possible profits in farming.

Registration and By-laws

Registration under the Poultry Runs Registration Act is required only of an owner who has 25 or more laying birds and sells eggs. Registration may be effected at any post office or by sending the fee to P.O. Box 379, Wellington. The fee is 2s. 6d. for each 100 birds or part thereof. Registration of a poultry run does not lay the owner open to restrictions on housing or management or to visits by inspectors, nor does it make the birds liable to inspection.

However, householders in cities and towns are advised to consult the local authorities about by-laws controlling the conditions under which poultry may be kept. Usually the minimum distance at which poultry houses may be built from dwelling houses is specified. Next month's article will deal with the choice of a site for a poultry house and the considerations which influence the type of house to be built.



Safeguarding Quality of Honey during Extraction

Seasonal Notes for the Domestic Beekeeper

By S. LINE, Apiary Instructor, Department of Agriculture, Invercargill

THE domestic beekeeper may not have much choice of a room to use as a honey house, and sometimes he may have to improvise with whatever is available, but selection of a place that gets the natural heat of sunshine will be a help in keeping stored combs of honey warm before and during extraction. When honey is also being strained into tanks and settling, so that small specks of wax and foreign matter rise to the top, the skimming off can begin earlier before the tanks of honey become prematurely chilled. If honey can be made to clarify quickly and all air bubbles and specks are removed from the surface, the introduction of starter or fine-grained honey can be attended to, thereby reducing one of the bottlenecks in extracting.

THE place where it is intended to extract the honey crop, whether it is a honey house or some improvised building, should have immediate surroundings that are prefectly clean, airy, and dry and there should be sufficient light to all parts of the room. A well-lit and roomy floor space is needed to strain honey adequately of all wax and small particles that would spoil the appearance of the finished product.

Avoiding Dampness

If a honey house is situated in a shady place or on the cold side of a house, dampness will linger on mopped floors and moisture will be drawn to tanks filled with honey. After a cold night beekeepers often find a film of water on tanks of honey, and if this is not skimmed off, there is danger of fermentation taking place later. Every effort should be made to keep floors dry and any drops of honey from supers or utensils should not be left to lie and soak into the floor, for this will inevitably draw moisture and the spores of fermentation will spread from this source. It is a good practice to have a number of metal trays or trays made of sturdy timber to hold columns of supers brought into the honey house. Trays can be made to stand 2in. clear of the floor so that a store trolley can be slipped underneath and the tray with supers shifted without honey being spilled from dripping combs. Wooden trays should be dipped into hot paraffin wax or painted with boiled linseed oil before being used so that they will not become saturated with honey.

The metal surfaces of tanks and extractor should be thoroughly dry before extraction begins, and the tinned surface should be examined for signs of wear or rust. If boiled linseed oil or spar varnish is wiped round the surfaces that come in contact with honey, especially where the tin has worn thin, any possibility of a chemical action which stains the honey and renders it bitter is eliminated. Treating the interior of home-made tanks with hot paraffin wax or with aluminium paint as is sometimes done is not so satisfactory, as scratching or chipping can occur more easily when a paddle or stirring stick rubs against the inner surface.

If tanks are stood upside down in a sunny spot to dry, they will not collect dust. When later these containers are filled dust should be excluded by covering them with a piece of sheeting kept moderately tight when stretched over each tank.

In setting up the various utensils to handle the crop the bearing of the lower pivot of the honey extractor should be packed with grease. Rubber steam tubes used the previous season are likely to be perished, and if they need to be replaced, thick tubing is preferable to light tubing and will keep the steam hot over a longer distance. An uncapping plane is less tiring on the wrist than an uncapping knife and is believed by those expert in its use to be faster, but where the supply of steam is produced by a light boiler over a primus or by one containing an electric element the knife appears to receive a better supply to keep it hot enough.

[*Commercial Studios photo.*
A thin brush (of tussock or manuka) used for brushing down bees from combs.

Straining Honey

Straining of honey is likely to involve hold-ups unless one has a simple way of dealing with the blockages that will occur as the material used becomes clogged with wax or honey that is heavy or too thick. Where cheese cloth is used it is desirable to have two or three bags or screens made so that when one becomes clogged it can be replaced. If two pulleys are fixed to the ceiling above each tank, the used bag can be hoisted up by a sash cord to drain while the second is put in position to use. The difficulty of washing the residue from the cloth without exciting bees with the waste watery syrup and the time bags take to drain over a tank are worth avoiding. Various inventions where wire mesh is used are successful, and where the beekeeper has not a large number of hives a simple design is sufficient. If the straining area has a fairly flat surface, it is simple to slide a tin scoop or scraper across the wire gauze and gather up into a bucket the material blocking the flow of honey.

A simple strainer can be made by using a clean spare hive super. A light frame is built to fit the interior surface of the super closely. On to this frame is tacked firmly some brass wire mesh that should not be more open than 16 strands to 1in. The cut edges of the wire should be overlaid by a light batten and nailed. Four pieces of wood should then be nailed to the inside lower edge of the super and the wire mesh frame rested on this. This super can then be supported over any tank by placing it on a frame that will reach across the tank. Such a strainer can be cleaned easily with a scraper when it shows signs of blocking and it will hold a bucket of honey at a filling. Where honey is very thin it is practicable to have two strainers, the finer mesh immediately below the coarser mesh, but the top one should be movable so that the lower one can be cleaned.

Removing Honey from Hives

At present there is no high-speed method of removing honey from hives. After the hive roof has been removed a generous blowing of smoke over the top of the frames will drive most of bees down to the lower part of the hive.

When most of the bees have deserted the top the whole super is removed and placed on a portable stand, for preference, or on an empty super in front of the hive with one frame removed. This leaves a gap in which a thin brush is swished along each frame to dislodge remaining bees which fall to the grass. The brush is used between all the frames, none of which has to be removed except the first. Before deciding to remove a super of honey the beekeeper should take a quick look down between the frames to estimate if most are capped. At least three-quarters of the surface of a comb should be capped before it is removed to the honey house.

Controllable Factors which Influence Wool Returns

QUALITY in wool commands a small but worthwhile premium at present—and, indeed, at most times—but weight of fleece has a more important effect on returns. Fortunately improvement in yield is usually accompanied by an improvement in quality. Factors affecting wool returns over which farmers can exercise some control were discussed by E. A. Clarke, Senior Research Officer, Department of Agriculture Animal Research Station, Ruakura, in a paper which he delivered to the 1951 Ruakura Farmers' Conference Week and from which this article is adapted.

AN understanding of the fundamental facts about the origin and growth of the wool fibre is helpful to an appreciation of the factors influencing the development of the fleece.

Development of Skin Follicles

The follicles in the sheep's skin which produce the wool fibres are laid down early in foetal life, and by the fortieth day after conception a definite pattern of follicles has appeared. As in the growth and development of the body, the follicles develop in orderly fashion. A wave of development spreads from the head down the midline of the back to the tail and from the back toward the belly and down the limbs. By about the ninetieth day the whole body carries a clear-cut pattern of follicles, arranged in trios. These, the early-founded or primary follicles, grow the coarsest fibres, which are usually hairy, and the kemps. They comprise the coarse outer coat of primitive sheep and are present in the improved breeds, particularly in the "halo hairs" which occur on many lambs and in the face and leg hairs. These fibres fall out of the fleece during the first few weeks after the lamb is born and are replaced in the same follicles by fibres which continue to grow indefinitely and otherwise generally resemble the fibres of the remainder of the fleece, but in some sheep they may be replaced by more coarse, hairy fibres and kemps which constitute a fault in the wool by reducing its range of usefulness.

Secondary Follicles

From about the ninetieth day onward many smaller follicles are founded about the trio groups. These are the secondary follicles and produce the true wool fibres which in the primitive sheep make up the fine undercoat. In the improved sheep the secondary fibres make up the bulk of the fleece, and around each primary trio group from 30 to 100 secondary follicles develop, according to breed and type of sheep. By the time the lamb is born its follicle arrangement and population are about complete. After birth, but for only a short time, a few more secondary follicles are laid down, but for practical purposes the maximum number of fibres the sheep can grow throughout its life has been decided by then. Moreover, for all practical purposes the course of follicle development in the foetus cannot be influenced by man, so efficient is the "buffering" ability of the mother against environmental changes. Follicle development and pattern are predetermined by heredity.

Structure of Follicles

The essential features of a primary follicle are shown in Fig. 1. The secondary follicle differs from the primary follicle chiefly in the absence of the sweat gland and the arrector muscle. The diagram also shows a medulla or spongy, air-filled core in the fibre; a true wool fibre lacks the medulla and is a solid fibre enclosed in the sheathing cuticle.

The workshop of the follicle is the papilla at its base. It is a region of active tissue well supplied with fine blood vessels and nerves, and by the budding off of new cells the fibre is pushed up and through the skin. The new cells have hardened and changed to keratin (the material comprising horn, hoof, fingernail, and wool) before the surface of the skin is reached. Once this has occurred the fibre is a dead structure and cannot be changed by the animal or improved by any practicable treatment of the growing fleece. Dipping, for example, can in no way improve it, but it may be damaged by such factors as dips, stains, sunlight, and micro-organisms.

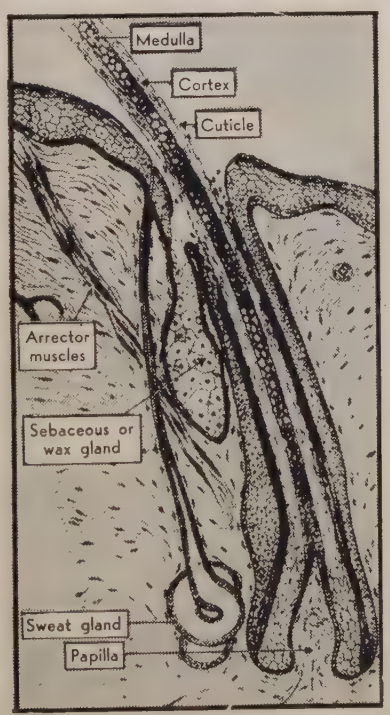


Fig. 1—Essential features of a primary wool follicle.

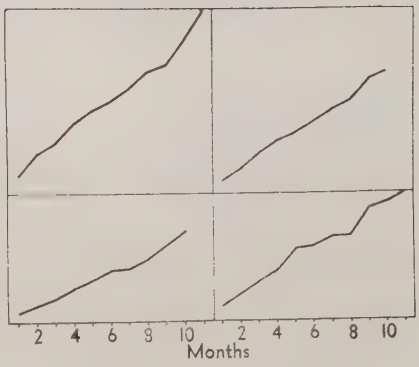


Fig. 2—Variations in the monthly wool-growth rate of four Romney ewes under conditions of unrestricted grassland feeding.

Influence of Nutrition

Many factors, however, influence the activity of the follicles and hence the amount and kind of wool produced. Apart from inherent factors, including breed, sex, and age, the greatest single factor is the level of nutrition. Maximum nutrition enables each follicle to produce the greatest possible amount of keratin and results in the coarsest and longest fibre possible. Lowered nutrition causes the output of fibre material to be reduced and results in a finer fibre, and to a less extent a shorter fibre, and also causes some follicles to cease functioning, temporarily at least, and thus to shed their fibres; this not only results in reduced fleece weight but also affects wool quality. Under extreme conditions shedding of the fleece can occur because of almost complete cessation of follicle activity.

Coarsest Fibres Least Affected

All follicles do not respond similarly to lowered nutrition. The first fibres to be affected are the later-founded secondaries, and the coarsest (early-founded) fibres seem to have first call on available nutrients. This results in an unfavourable change in the quality of the fleece. Quality is also affected by breaks, tenderness, cotting, and uneven crimping caused by irregular growth of the fibres.

Variations of Growth Rate

Apart from the kemps in the fleece, the fibres normally continue to grow indefinitely and, if the level of nutrition is adequate, at a constant rate. Under experimental conditions fleeces have been grown for 3 to 4 years, weighing up to 70lb. and showing almost perfectly regular growth. Fig. 2 shows variations in the weight of wool grown per month by Romney ewes under conditions of unrestricted grassland feeding. Perfectly regular growth throughout the year is unusual, and a depression in growth rate corresponding with the end of pregnancy and the beginning of lactation occurs commonly, usually manifesting itself as a "break" in the staple. At present the cause of this break is not known, but a sudden drop in feed supply, a change to poor-quality feed, or illness is known to be capable of causing a severe break at any time.

There's no better Phenothiazine than Elliott's

PHENZEEN PLUS

Farmers throughout New Zealand are again demonstrating their preference for Phenzeen Plus with a rush of orders for this drenching season.

The Original Liquid Phenothiazine

Phenzeen Plus was the first ready-mixed liquid phenothiazine, and the first to overcome the need for continual stirring. That early leadership is still maintained in an even better product.

The Only Double Processed Liquid Phenothiazine

The technical staff of Premier Products Ltd., the New Zealand manufacturers and distributors of Phenzeen Plus, has developed an exclusive double-process formula which makes Phenzeen Plus uniform from top to bottom of the tin. It pours freely to the last drop and under no conditions does it settle hard. It's ready to use and easily administered with the Phenzeen Plus Automatic Injector or Dub-Ell-Dose Pistol. Supplies are good but demand is increasing daily, so

Don't be Disappointed . . .

Order Now

Agents and Stockists everywhere. If any difficulty is experienced in obtaining supplies write to the N.Z. Manufacturers and Distributors:

PREMIER PRODUCTS LTD.

HUDDART PARKER BUILDING,

WELLINGTON.

double hung "LIFT-UP" WINDOWS

- *Look smarter—easily kept that way.*
- *Never warp, twist, or stick.*
- *Cannot rust or rot.*
- *Never need painting.*
- *Good weathering — excellent ventilation.*

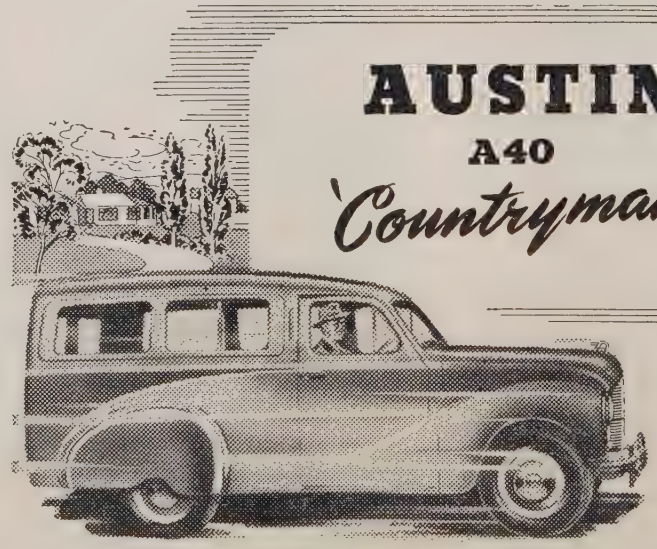
Now, lift-up windows can be really modern—if you use ALWINTITE Double-Hung ALUMINIUM WINDOWS. They *glide* up and down—silently, smoothly . . . are smart and strong. ALWINTITE Aluminium windows are a pleasure to live with—can be used harmoniously with any type of construction—COST NO MORE THAN TIMBER SASHES. Insist on ALWINTITE DOUBLE-HUNG ALUMINIUM WINDOWS for your home. *Write for details of the three distinct types now immediately available.*

ALWINTITE double-hung ALUMINIUM WINDOWS

Sole N.Z. Distributors: RESIDENTIAL CONSTRUCTION CO. LTD.

Auckland: Private Bag. Hamilton: Box 672. Palmerston North: Box 307.
Wellington: Box 2052. Christchurch: Box 1168. Dunedin: Box 915.

AUSTIN A40 'Countryman'



A brilliant-performing versatile vehicle, quickly convertible from commercial utility to passenger car comfort.

Six people with luggage or two people with 10cwt. of goods; whichever is needed, the Austin "Countryman" is the perfect answer. Handsome in appearance, yet practical in every detail, this vehicle will appeal especially to rural dwellers and tradesmen.

For performance and lasting service the Austin A40 "Countryman"—*you can depend on it!*

THE VEHICLES THAT BEAR THE FAMOUS PHRASE . . .

Austin of England

Distributors for **AUSTIN OF ENGLAND**

AUCKLAND: Seabrook Fowlds Ltd. **HAWKE'S BAY:** Anderson and Hansen Ltd. **WELLINGTON:** Magnus Motors Ltd. **TARANAKI:** The Farmers' Co-op. Orgn. Society of N.Z. Ltd. **CANTERBURY & WESTLAND:** David Crozier Ltd. **OTAGO:** Austin Motors (Otago) Ltd. **SOUTHLAND:** P. H. Vickery Ltd.

Table 1—Effect of Condition on Fleece Weight of Ewe Hoggets

Group	16 March		1 June		26 September		28 September
	Body weight (pounds)	*Grade	Body weight (pounds)	*Grade	Body weight (pounds)	*Grade	Fleece weight (pounds)
1	53.1	6.5	53.8	6.7	71.7	5.8	4.8
2	52.4	6.6	58.7	5.3	78.0	4.9	6.6

* 1 = fat, 10 = emaciated.

An extreme case of irregular growth rate is illustrated in Fig. 3. During 14 weeks of winter growth almost ceased, resulting in an extreme break, much shedding, and extreme cotting. The cotting is caused primarily by fine shed fibres becoming entangled among the growing fibres and the mass felting so tightly that it cannot be separated without much fibre breakage.

Pre-lambing and Double Shearing

Pre-lambing shearing results in a fleece of full 12 months' growth free from the pre-lambing break. Experiments at Canterbury Agricultural College, Lincoln, showed no increase in wool production from winter shearing, but the wool was cleaner, brighter, and free from breaks and cotts. Such wool might be expected to be more valuable, but in general it does not seem to have brought increased prices. That has been the experience of many South Island farmers.

Double shearing results in two short fleeces which total little more than the weight of the normal 1-year fleece. Experimental results indicate that the increased wool growth seldom exceeds a couple of ounces—insufficient to cover the extra cost of a second shearing. Furthermore, the short wool is of restricted usefulness and unsuited for specialty uses such as in paper felts, spinners, and preparing. It meets a much poorer demand and the price is usually disappointing.

Many farmers claim marked increases in wool production as a result of both pre-lambing shearing and double shearing, but wool production is very closely associated with seasonal conditions, and the average fleece weight of a flock can vary appreciably from season to season. Controlled experiments have shown that time and frequency of shearing have little effect on the wool yield.

Condition and Fleece Weight

The effect of level of nutrition on the growth rate, fatness, and wool production of two similar groups of ewe hoggets is shown in Table 1. These hoggets were shorn as lambs in late January and divided into two groups of about 200 each in March. Thereafter they were run separately until they were shorn. The striking feature of the figures is the big drop in fleece weight (about 27 per cent.) associated with a comparatively small drop in liveweight, which allowing for wool carried is only 4.5lb., or less than 6½ per cent. Had both groups been heavier throughout, a difference in liveweight of this order might have produced little effect on fleece weight, but such information has yet to be obtained. The lower average fleece weight of the second group may also be associated with greater irregularities in the shape of the growth curve between weighings.

The effect of level of nutrition on the wool production of 5-year-old breedings ewes is shown in Table 2. In these mature animals, each of which reared a lamb, the effect of low-plane feeding on wool production, though substantial, was less marked than in the hoggets. The greatest effect of poor nutrition on wool growth of breeding ewes occurs during pregnancy rather than during lactation, but the effect on lamb growth is the reverse.

A ewe has remarkable powers of preserving the developing foetus and in times of lowered nutrition suffers heavy loss of body weight and greatly reduced wool production to produce a normal full-term lamb. A lowered level of nutrition during pregnancy of breeding ewes in the South Island was responsible for a reduction in fleece weight of the order of 1 to 1½lb., but a similar change after lambing caused a reduction of only ¼ to ½lb.

Table 3—Effect of Nutrition on Fleece

	High plane	Medium plane	Low plane
Average fleece weight (lb.)	9.0	8.9	8.5
Fleeces graded very good (%)	12.4	8.6	5.3
Fleeces graded good (%)	33.0	33.3	12.6
Fleeces graded medium and poor (%)	54.6	58.1	82.1
Fleeces with break (%)	6.2	8.6	31.2
Fleeces cotted (%) ..	2.1	3.2	8.3

The effect on wool growth of plane of nutrition in 5-year-old ewes for short periods beginning on the average about 50 days before lambing is shown in Table 3. The high-plane ewes gained at about 5.2lb. per week and the medium-plane ewes at 2.9lb.; the low-plane animals were maintained at a constant mean liveweight of 124lb.

The medium- and high-plane ewes differed little in either fleece weight or quality, but these two groups showed marked improvements over the ewes kept at constant body weight. This points to the desirability of maintaining an optimum liveweight increase rather than aiming at the maximum. The precise definition of this optimum is not yet possible, nor can the most economic feeding level be described.

Table 2—Effect of Plane of Nutrition on Fleece Weight of Breeding Ewes

Group	Liveweight (pounds) Feb.	May	Aug.	Oct.	Dec.	*Fleece weight (pounds)	Yield (per cent.)
1	100.5	113.0	135.3	129.2	127.5	9.3	71.0
2	97.7	111.4	126.4	124.5	119.3	8.8	70.2
3	98.8	101.4	108.7	107.9	109.4	7.4	71.2

* Excluding belly wool and locks.

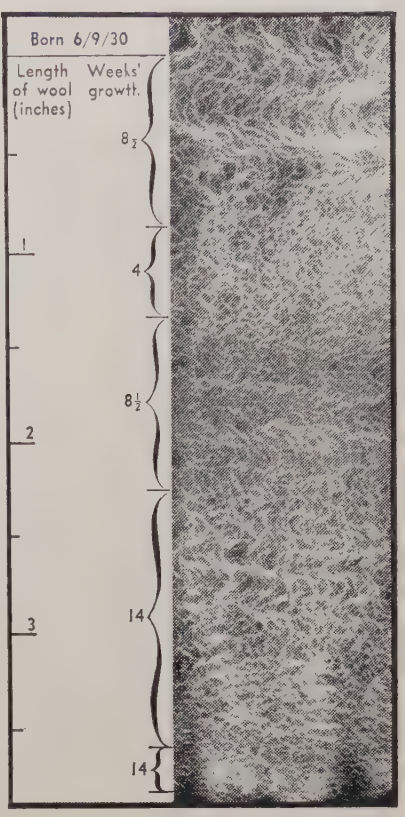


Fig. 3—The staple of a ram's wool showing extreme irregularity of growth. The last 14-week period was from 7 May to 13 August.

Weight and Quality

The fact that weight greatly overshadows quality in effect on wool returns has always been obvious. Crossbred wool is second in grade to Merino types in world trade and is used in articles in which quality in its broadest sense is less important. Such wool is often used only because better wools are more costly, but there is some premium for quality. The main quality considerations (within fineness grades) affecting the price per pound of fleece wool are as follows; originating from the days of wartime control, these types are now more or less generally recognised in the trade in New Zealand:—

Good-super (A): Good colour, well grown, sound, well skirted, free, may contain very slight fault, suitable spinner.

Good (BB): Good colour, well grown, well skirted, free from seed, may contain slight tender.

Good-average (B): Good topmaking, fair to good colour, skirted, may contain odd cott and/or very slight seed.

Average (C): Topmaking, fair colour, may contain few odd cotts, may be unskirted and/or bush stained and/or part seedy.

Average-inferior (D): Average to inferior topmaking, may be poor colour, may be cotty and/or seedy, unskirted and/or bush stained.

64—WOOL RETURNS . . .

Effects of the main wool qualities on price are shown in the following figures; they can be only approximate because of the instability of wool values and the consequent difficulty of deriving valid average values:—

Grade	Count	Approximate price per pound Nov. 1950	Jan. 1951
BB	52	110	151
	50	109	148
	48/50	106	140
	46/50	105	138
	46/48	107	140
B	52	106	149
	50	103	143
	48/50	103	140
	46/50	101	135
	46/48	103	135
C	52	101	140
	50	97	133
	48/50	96	131
	46/50	95	129
	46/48	96	131

Grade and count (fineness) are shown to have an appreciable effect on values, and yield influences price at the rate of about 2d. per pound for each 1 per cent. change in yield. With wool at 140d. per pound, however, an increase in fleece weight of a few ounces can offset much loss of quality. Fortunately, all work on wool improvement tends to demonstrate that increased fleece weight, whether achieved by breeding or by feeding, is accompanied in some degree by improvement in quality.

Benefits of Culling

Worthwhile increases of wool production can be achieved by culling. The rate of culling of hoggets varies considerably with such factors as the lambing percentage and the death rate in all classes of stock, but usually it ranges from 30 to 40 per cent. of the hoggets available and under most favourable conditions may reach 60 per cent. Much of this culling can have the aim of raising wool yield.

Considerable evidence shows that of the increase in average wool production per head achieved by culling hoggets at least half remains in each subsequent year the selected animals stay in the flock. Thus, if by culling 40 per cent. of hoggets the wool production of the remainder is increased by an average of 2/3lb. per head, at least 1/3lb. per head of increase is to be expected from these selected sheep in each subsequent year, or during their productive life a total increase of 1 to 1½lb. of wool per head. In many flocks the increase has been greater.

Only half the increase is realised in the 2-tooth and older ewes because hoggets vary considerably in age, size, and development, they are relatively immature and the weight of wool carried has been influenced greatly by environment. Therefore the weight of a hogget's fleece is not a perfect index of production capacity at maturity.

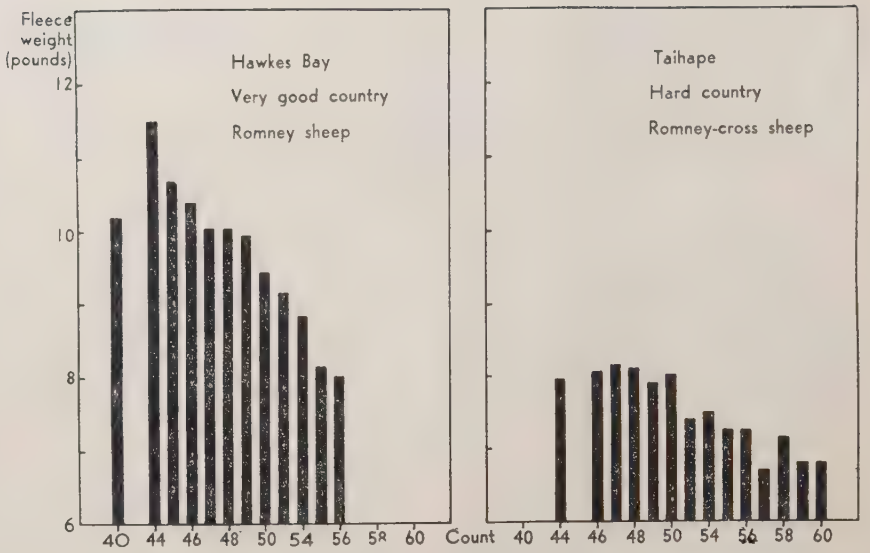


Fig. 4—The relation between fleece weight and count.

In the selection of hoggets for heavy wool production a few important principles must be kept in mind. By and large, the stronger is the wool the heavier is the fleece. At present there is little premium for fineness, so in general the stronger types are more profitable. Wool surveys have shown that the better is the country the better is it able to grow stronger wools, as is illustrated in Fig. 4.

Therefore the finest wools in the flock are not the most profitable. Rather the aim should be, in moderation, to produce the stronger types which careful inspection indicates can be well grown on the country.

Selection of hoggets for heavier wool production is neither difficult nor very time consuming. The decision having been made on the count range to be aimed at, culling consists essentially of eliminating hoggets outside the range, those with short, dense, fuzzy fleeces ("down type"), and those with markedly faulty fleeces showing break, cotting, and weak open backs. The ideal is a long, well-grown, "meaty" staple, evenly and clearly crimped over the whole fleece, with belly and points well covered. Such a simple ideal, conscientiously aimed at by anyone with even a meagre knowledge of wool quality, cannot fail to achieve worthwhile results for the expenditure at the outset of no more than 1 day per 200 to 300 hoggets. Moreover, the efficiency of the work can be tested immediately by shearing the culled and selected sheep as two mobs and comparing mean fleece weights.

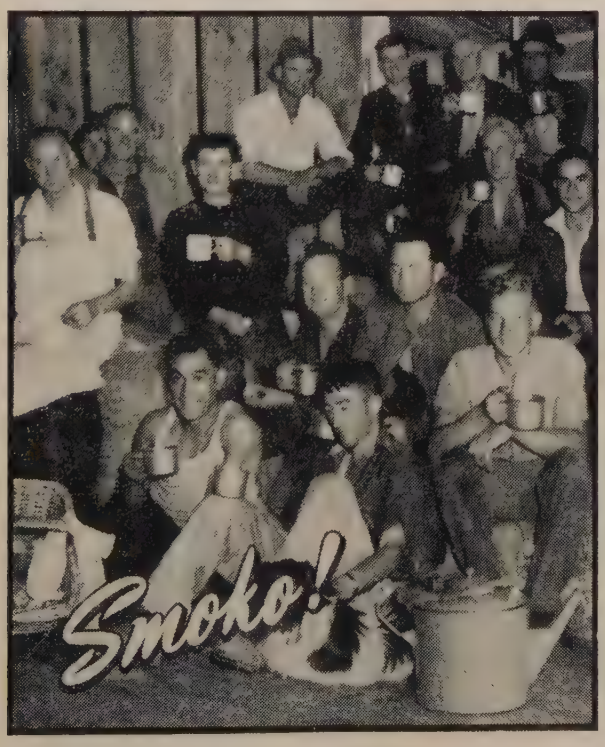
Fleece weight is only weakly inherited and the improvement achieved by culling largely disappears in the following generation. For example, if culling results in an increase in fleece weight of 1lb., only 10 to 15 per cent. of this increase can be expected in the progeny of these sheep. Greatest scope for permanent improvement lies in the selection of the flock sires.

ON some types of farm machinery adjustment levers and handles can inflict painful injuries and occasionally are the cause of a fatality. For example, the handle in the illustration is so close to the fuel tank that it constitutes a hazard if a dip in the ground is encountered while an adjustment is being made. Plough handles also contribute to the toll of farm accidents. Some ploughs have handles which reach close to the operator's back, and men have been pinned to the seat by a tractor stalling on a rise from a sudden dip while the plough pushed forward. If the handle is so far away that the operator must leave his seat to make adjustments, losing his balance may result in his being mutilated by the implement. These conditions can be avoided by adapting implements to the type of tractor. All handles should be made to suit the tractor. Throttle handles may stick or be hard to reach in an emergency; they should be kept oiled and be placed in an accessible position.

—J. N. M. WHYTE, Farm Machinery Instructor, Department of Agriculture, Dunedin

COOKING FOR SEASONAL WORKERS

THE thought of having to cook for perhaps a dozen extra men may worry the inexperienced person, not because she cannot cook, but because she does not know either the quantity to cook or how long the preparation and cooking will take. Because of the difficulties which may arise in the cooking of a large quantity of food on the household range or electric stove, this article by Nell Macpherson, Rural Sociologist, Department of Agriculture, Auckland, includes two sample menus and outlines for each day.



LARGE-SCALE catering often presents a problem to the person who has had little experience of it, particularly if the occasion is a busy one for the whole family. Most people cope successfully with an influx of visitors on a special occasion, as the meals are served in the house, but for an occasion like haymaking, shearing, or fruit picking a different technique must be used, as often it is impossible to seat all the people round the table, to "stagger" the meal hours, or to use a buffet style of service.

The problem has varying aspects, as the housewife may be called on to provide for meals and two "smokos" in the day, and quite often the meals must be first cooked and then carried some distance. Therefore it is essential when planning large-scale catering of this type not only to organise the meals and their preparation, but also to leave time for their transportation to the field. Of course, the cardinal rules of all meal service apply: Hot dishes must be hot, cold ones must be cold, and the food should be served as attractively as possible.

To attain these objectives more easily it is wise to try to serve cold meals in the field. They should be plain; fussy, time-consuming details are attractive at afternoon tea, but quite often the garnishes have become wilted and unappetising by the time they reach the field.

The meals which approximate to breakfast and dinner are usually served in or close to the house, and the "teas" and lunch, which must be substantial meals, are those with which difficulty sometimes arises. In the menus and directions which follow, the instructions may clash with normal good practice in preparation of foods to retain their nutritive value, but these are not normal practices to be followed every day of the year; rather are they designed to cope with a special occasion which may reasonably be called a housewife's emergency. The day before the first menu is to be served certain preparations can be made which materially lessen the work on the days when the menus are served without making this day too exacting in view of the usual housework to be done.

SCRUB & WEED CONTROL . . .

at LOWER COST

Stantox T.45 gets rid of scrub, quickly, *more* efficiently and *more* economically . . . just spray it on and watch results. And use Stantox T.45 on extra-difficult-to-kill weeds

4785-4

stantox

BEST BY TEST T-45

Sole N.Z. Agents

J. H. BARBOUR & SON LTD.

86 Wakefield Street, Wellington.

"CRANKO" STEAM LAUNCH

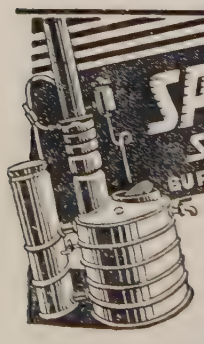
RUNS ON REAL, LIVE STEAM FOR 15 MINS.

Raise steam, and away! Just like the real thing. Graceful model carefully designed for buoyancy, stability, speed. 21in. long x 5in. beam. One fill lasts 15 mins. Superb model in every way. Price 105/-, post free.

MAIL YOUR ORDER direct to manufacturers. Money refunded if not satisfied. Send stamped addressed envelope for illustrated list other "Cranko" models.

MOVIE MODELS

HAVELOCK NORTH — HAWKES BAY.



SPEEDWAY STERILISER

BURNS OIL OR WOOD

Write for free illustrated catalogue to Speedway Products Ltd., 26 Albert St., Auckland.

South Island Distributor: A. H. Turnbull & Co. Ltd. Christchurch

STEAM & BOILING WATER

SS 1-2

Marathon "Foamtreads" set a new standard of comfort and smartness in informal and holiday wear . . . made in N.Z. by Marathon Rubber Footwear Ltd., under exclusive license from Ro-Search Incorporated of U.S.A. At all retailers.

MARATHON "Foamtreads"

For "THE WALK THAT RELAXES"

YOU TRAVEL ON A.B. • YOU SLEEP ON AIR • NOW WALK ON AIR

DISTRIBUTED THROUGHOUT N.Z. BY SARGOOD SON & EWEN LTD

	MENU 1	MENU 2
Breakfast (8 a.m.):	Porridge Fried chops Bread, butter, marmalade Tea	Stewed fruit or porridge Bacon and scrambled eggs Heated left-over vegetables Bread, butter, honey Tea
Morning tea (10.15 a.m.):	Sandwiches Drop scones Tea	Bread, butter Scones Tea
Lunch (12.30 p.m.):	Cold double-crust meat pie Buttered bread Tomatoes, cucumber Biscuits Tea	Aberdeen sausage Tomatoes, lettuce, cheese Bread, butter, jam Tea
Afternoon tea (3 p.m.):	Sandwiches Cold meat pie (if any) Drop scones Biscuits Tea	Sandwiches Scones Sponge cake (if no biscuits remain from Menu 1) Tea
Dinner (6.30 p.m.):	Mutton stew Potatoes, carrots, parsnips Cabbage Fruit pie Tea	Roast mutton Potatoes, onions, cauliflower Steamed pudding Tea

A laundry basket is a convenient carrier in which to transport a meal to the field.

OUTLINE OF TIMETABLE FOR THREE DAYS

DAY BEFORE

Prepare and cook meat for the pie.

Prepare and cook Aberdeen sausage.

Make the meat and fruit pies.

Put on the mutton stew to cook.

After the stew has cooked stand it aside to cool.

Make the porridge. Cut and trim the chops.

Mix the dry ingredients for the drop scones.

Prepare the cold drinks for the field.

MENU 1 DAY

Heat the porridge. Cook the chops in the baking dish in the oven. Fill the top of the stove with kettles for hot water. Make beds and do any essential jobs while the breakfast is cooking. Make the gravy and serve the breakfast.

Mix the drop-scone batter and start baking the scones. Have own breakfast. Wash up.

After the drop scones are cooked put in biscuits or small cakes to cook. Cut sandwiches and butter bread for lunch. Fill the sandwiches with cheese, egg, and pickle. Butter the scones. Sweep the kitchen. Make tea and take it out to the men. Have own morning tea.

Wipe the tomatoes. Peel the cucumber, cut it into 1in. slices, and wrap it in waxed paper. Cut the meat pie into large pieces. Wash up. Pack the biscuits, sandwiches, and scones in tins or shoe boxes. Make tea and take it out to the men. Have own lunch at the house and rest for ½ hour.

Cut more sandwiches if necessary and butter scones. Pack the food. Make the tea and carry it out.

Have own afternoon tea. Wash up. Prepare vegetables and do any other essential household tasks.

At 5.30 put on the potatoes and the carrots and parsnips in one pot. Skim the stew, reheat it, and thicken it. At 6 o'clock put on the chopped cabbage and put the fruit pies in the oven to heat through. Take care not to scorch the pies; put an extra slide or a folded newspaper across the top if necessary.

Mix the porridge. Serve the dinner.

Put the porridge and fruit to be stewed on to cook while dinner is being eaten. Make tea. Wash up.

MENU 2 DAY

Heat the porridge. Put the bacon in the oven to cook. Heat the kettles. Heat left-over vegetables in the bottom of the oven. Prepare the scrambled eggs and put them on to cook at the side of the stove or on a slow element ½ hour before breakfast. Make the beds. Serve the breakfast.

Have own breakfast. Wash up.

Mix and bake the scones. If necessary, mix the sponge and bake it. Cut bread and butter for morning tea and lunch. Sweep the kitchen. Butter the scones. Make tea and carry it out. Have own morning tea.

Cut the Aberdeen sausage into pieces. Wipe the tomatoes, wash the lettuce, and cut the cheese into pieces. Pack the food and place a pot of jam and a knife in the basket. Make the tea and carry out the lunch. Have own lunch at house and rest for ½ hour.

Cut the sandwiches for afternoon tea. At 2.30 put the mutton on to roast. Prepare the dry ingredients for the steamed pudding. Butter scones and cut the cake. Wash up.

Reduce the heat under the mutton, or place a cold slide in the oven if using a fuel range. Make tea and take the afternoon tea out to the men.

Mix the steamed pudding and start it cooking between 3.30 and 4 p.m. Have own afternoon tea. Do any essential household jobs. Prepare the potatoes and onions and put them in with the meat at 5.30. Prepare the cauliflower and put it on to cook at 5.45. At 6.15 make the gravy, using the cauliflower water. Serve the dinner. Make tea. Wash up.

Varying the Timetable

The timetable given is elastic and may be adapted to varying conditions and sizes and ages of families. Should there be children of school age, they may make a difference to the early-morning schedule because of the necessity to cut lunches, but this is compensated for by the fact that before going to school they can do some of the essential household tasks, such as making beds, sweeping, table setting, and peeling potatoes. In the evening they can help with the washing up.

If there is a young baby in the family, the housewife can make time to attend to his needs by eliminating baking during the two days. She can serve biscuits such as crackers instead of scones, and a block of bought fruit cake can be a useful standby. Eliminating the baking does not make the two days easy for the housewife, but it does make them less hard.

Tins may be filled with biscuits, cornies, date rolls, fruit squares, and shortbread during the previous week. These foods keep well and the work of making them can be spread over several days.

When Milking Intervenes

For the housewife who milks cows daily these two days are strenuous, as the morning milking interferes with the breakfast preparation and the evening milking with the dinner preparation. However, if she serves foods which require steady, slow cooking, such as mince, smoked fish, or stewed sausages, they can be put on to cook over gentle heat while she is out of the house. Possibly she will not be expected to provide breakfast or dinner.

If the housewife has to take out the food for the outdoor meals, she can send the milk, sugar, and cool drinks out with the men first thing in the morning.

Packing the Food

A laundry basket is probably the easiest thing in which to pack and carry the food, as the tea can also be packed in it. The tea is best kept hot by being poured into a billy with a lid and the billy wrapped in several thicknesses of newspaper, in sacking, or in an old blanket.

Buttering drop scones for morning or afternoon tea.

Quantities of Foods

The quantities which follow are estimated to make enough of each dish for 12 men:—

Porridge: 4 cups of rolled oats or oatmeal.

Chops: 2 per man.

Drop scones: 1½lb. of flour and other ingredients in proportion make 3 dozen.

Pastry: 2lb. of flour and other ingredients in proportion make enough for both meat and fruit pies.

Meat pie: 2lb. of beef steak is enough for a double-crust pie in a large baking dish.

Biscuits: 1lb. of flour makes 4 to 6 dozen biscuits.

Mutton stew: 7lb. of mutton (neck, breast, flaps, and shanks).

Vegetables: 4lb. of potatoes, 2lb. of carrots, 2lb. of parsnips, 4lb. of onions, 4 to 6lb. of cabbage, and 3 medium-sized cauliflowers.

Bread: Two 4lb. loaves each day.

Bacon: 4lb.

Eggs: 12 to 18.

Scones: 2lb. of flour and other ingredients in proportion.

Aberdeen sausage: 3lb. of steak.

Cheese: 3lb.

Sponges: A 3-egg sponge made in a flat pan.

Roast mutton: A leg and a shoulder.

Steamed pudding: ½ to ¾lb. of flour.

Salad vegetables: 6 lettuces and 3 or 4 cucumbers if they are available from the garden; 18 to 20lb. of tomatoes.

Make sure the larder contains a plentiful supply of tea, sugar, baking powder, flour, and butter.

Ordinary household equipment should suffice to cook the meals. Two large baking dishes are needed.

Only tried and trusted recipes should be used at an extra busy time. Trying out new recipes may result in failures because of the extra calls on the housewife's time.

Rest Periods

If possible, such weekly tasks as washing clothes should be done before or after the busy period, which is already full enough. If a little time can be spared, the housewife should have a rest or a break in the open air, as the working day is already long, particularly if the dinner hour is set back to allow the men to finish a job, as it may be in threatening weather.

The housewife's working day is unlikely to end until 1½ hours after the evening meal has been served, so should the men ask for an extra afternoon tea and a late dinner at, say, 8.30, it will be 10 p.m. before the housewife puts away the last plate. If she has not had an extra rest, she will be very tired and probably rather irritable by this time.

Recipes

Aberdeen Sausage

3lb. of steak	1 small onion
1½ cups of breadcrumbs	½lb. of bacon
2 eggs	1 tablespoon of Worcestershire sauce
1½ teaspoons of salt	1 teaspoon of pepper

Mince the bacon, steak, and onions. Add the breadcrumbs and other ingredients and mix them thoroughly. Form the mixture into a roll, tie it in a floured cloth, and boil it for 2½ to 3 hours. Turn it out and roll it in either fine breadcrumbs or oatmeal.

Steamed Fruit Pudding

Fill a large enamel pudding bowl two-thirds full of cut-up fruit, such as rhubarb, apple, and gooseberries. Sprinkle ½ to 1 cup of sugar over the fruit.

Mix a scone dough, using 8oz. of flour. Pat it into the size and shape of the top of the bowl and place it on top of the fruit. Cover the pudding with either greased paper or the lid and steam it for 1½ to 2 hours.

Three tablespoons of golden syrup or treacle may be used instead of some of the fruit.

Foundation Cottage Pudding

6oz. of butter	3 eggs
6oz. of sugar	Milk if necessary
12oz. of flour	1½ teaspoons of baking powder
Flavouring	

Cream the butter and sugar and add the beaten eggs. Add the dry ingredients and mix them in. Add a little milk if the mixture is too stiff to drop from a spoon. Steam the pudding in a covered greased bowl for 2 hours. These quantities make 12 to 16 servings.

This recipe may be varied by adding 2oz. of melted chocolate, ½ cup of chopped fresh fruit or soaked dried fruit, 4 tablespoons of raisins or currants, ½ cup of chopped stoned dates, or 2 tablespoons of raspberry jam to the mixture, or by lining the pudding bowl with jam.

Drop Scones

1½lb. of flour	¾lb. of sugar
3 eggs	3 heaped teaspoons of baking powder
1 breakfast cup of milk	

Sift the flour and baking powder into a bowl. Beat the eggs, sugar, and milk together and pour them into a well in the flour. Fold in the flour. Drop the mixture in large spoonfuls on to a cold greased tray. Bake the scones in a hot oven (450 degrees F.) for 10 to 15 minutes. Do not crowd them on the tray, as they spread.

Photographs by Sparrow Industrial Pictures Ltd.

Cleaning Felt Carpets

AN article on the care of carpets in the February "Journal" made no mention of felt carpets. Shampooing is as efficient a method of removing dirt from a felt carpet as from a woven carpet, but there is a distinct danger that, being nearly pure wool, the felt will shrink badly. It has been known to shrink as much as 2 to 3in. in a yard. If the felt is tacked down firmly all round, it can be shampooed safely, as the tacks will prevent it from shrinking unless it is very old and thin, when it may tear away from the tacks.

A felt carpet which is to be moved into a smaller room can well be shampooed before being cut to fit the new floor, but if it exactly fits the room in which it is to be laid, shampooing it is not safe unless it is firmly tacked down all round. If the carpet is not to be tacked, it cannot be shampooed.

—*EIRENE E. UNWIN,*
Rural Sociologist, Department of Agriculture, Christchurch

Bulbs for Early Planting in the Flower Garden

TULIPS, hyacinths, and narcissi normally are not planted until March, April, or May in New Zealand, but most other spring-flowering subjects benefit from earlier planting. Many of these subjects flower later than tulips and other late-planted bulbs because they need a considerably longer growing season to achieve their maximum development. Should any of these bulbs be kept out of the ground for longer than their normal dormancy, their vitality is reduced greatly. For best results, therefore, they should be planted not later than February in most parts of New Zealand. In this month's article for the flower gardener C. K. Ellis, Horticulturist, Department of Agriculture, Dunedin, discusses the bulbs which require this treatment.

ANEMONES: Most varieties of *Anemone coronaria* needed for early flowering should be planted as early in February as possible in a warm, sheltered, well-drained site in which the soil has been well worked.

Freesias may be grown successfully outdoors in almost any part of New Zealand except where winters are extremely cold. They may be grown in pots or boxes for early flowering if the climate is considered unsuitable for their outdoor culture. An ordinary seed tray can be filled to within ½in. of the top with a good potting compost, which should be firmed and the surface made level. The bulbs are planted about 2in. apart each way and about 1in. deep. The box is stood in a sheltered position and kept moist until the foliage appears, and from this stage onward they should be watered more frequently and be given the protection of a greenhouse or cold frame if possible. An alternative is to support a sheet of glass over the top of the box. Protection from cold winds and frosts should be given until May, when the boxes or pots can be transferred to a warmer atmosphere with plenty of light.

Freesia burtoni is the best of the species and varieties available to the home gardener. Many new and highly coloured hybrids are now being grown in the cut-flower trade, including mauves, pinks, yellows, oranges, and lavenders. These varieties can be obtained from nurserymen and seedsmen, but they are not generally as satisfactory for the home gardener as *F. burtoni*.

FREESIA BURTONI

Frittilarias: The crown imperial (*Frittilaria imperialis*) dislikes wet or cold soils, but grows to perfection in those which are deep and fertile. It appreciates heavy dressings of well-rotted animal manures dug in fairly deeply. Fresh animal manures should never be used, for burning and other damage is likely if the bulbs or their roots come in contact with them. Bulbs such as the crown imperial are often planted with a layer of sharp sand under and around them to prevent their touching any materials which may have a burning effect. Such burning is usually a starting point of serious fungal or bacterial rots. The bulbs of frittilarias deteriorate with extreme rapidity if left out of the ground for longer than a few days.

Frittilaria meleagris is a most desirable plant for the garden, especially if it can be given a cool, open space in which it may grow to perfection. It grows only about a foot high and bears pendulous, bell-like flowers on extremely slender stalks. There is a purple, speckly type and one or two varieties, the best known of which is a white form. These bulbs may be left undisturbed in the ground for many years once they have become established.

Grape hyacinths (*Muscari*) succeed almost anywhere and multiply rapidly. They are extremely common, but are seldom used to best effect, which is undoubtedly as a mass or as a naturalised subject beneath deciduous trees.

Irises: Most bulbous irises benefit greatly from early planting. Dutch irises are very useful both for the flower border and as cut flowers, for they bloom when most other spring flowers, such as the tulips, have finished and they fill the gap before the roses begin to appear. They do not mind being planted only a few inches apart in small groups provided they are given a reasonably fertile soil in a well-drained position. They will succeed comparatively well for several years without being disturbed if they receive a considerable intensity of sunlight during late summer and autumn. The most popular varieties are Wedgwood, Yellow Queen, Imperator, and Rembrandt.

English irises are slightly hardier than the Dutch irises and require a cooler soil, open in texture and free draining. They do not like dry and hot conditions. They begin flowering in most parts of New Zealand in late November and December and the flowers are considerably larger than those of the Dutch type. King of the Blues, probably the most popular variety, has flowers of violet blue, but many other varieties in soft blues, mauves, and whites are available.

LACHENALIA AUREA

Spanish irises are similar in most ways to the Dutch types, but they have longer and more slender stems and produce their flowers slightly later. They prefer warm, well-drained soils.

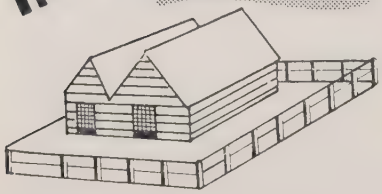
Iris pavonia (peacock iris) is a South African native with slender upright foliage and large blue and purple flowers. It requires a good soil and perfect drainage and is probably best suited to the rock garden. Its flowers are produced during October, and once established it need not be lifted for several years.

Iris reticulata is one of the earliest of the bulbous irises to flower and in a good season will produce blooms at the end of winter. It succeeds reasonably well in most garden soils, though a well-drained situation is probably preferable. It is an excellent subject for the rock garden, where its rich purple flowers with their gold markings can be seen to best advantage.

Iris tingitana, one of the most beautiful of all irises, is not difficult to grow and flower, contrary to the opinion of many gardeners, provided the soil is warm and well drained. The best method to induce this iris to flower profusely has been the subject of much argument and discussion. Many growers lift the bulbs annually after the foliage has died down completely and allow them to be baked in the sun for some time before replanting them. Undoubtedly the principle underlying this method is correct, because the treatment most nearly simulates the climatic conditions in the natural habitat of the plant, which is Tangier. It is an admirable cut flower both because of its appearance and because it flowers during late winter.

Lachenalias on the whole are treated in much the same way as are freesias, the only essential difference being that they require a slightly more open compost. They are admirably suited to culture in pots or hanging baskets.

£ THOUSANDS INVESTED IN YOUR FARM BUILDINGS



Boracure treatment offers you a simple, inexpensive way to protect your woolshed, barns, house and other buildings from depreciation by borer and rot fungi.

Boracure treatment is guaranteed to kill borer and fungi. It prevents reinfestation. It lasts the lifetime of the property. It can be safely used where stock is kept.

PROTECT them from depreciation by BORER and DECAY

An inspection of your property, places you under no obligation. Contact your nearest Boracure Branch, or write —

There is only ONE GENUINE BORACURE

Boracure treatment is chargeable to maintenance expenditure for income tax purposes when applied to income-producing property.

BORACURE (N.Z.) LTD.

HEAD OFFICE, 105 CUSTOMHOUSE QUAY, WELLINGTON.
MEMBERS OF NATIONAL PEST CONTROL ASSOCIATION. U.S.A.

Farms, Homes, Holiday Residences, etc. "beyond the power lines."

Marvellous, Comforting WATER—PUMPED WITHOUT ELECTRICITY

Home comfort and convenience start when water starts running. If you laboriously pump water by hand, or cannot install an automatic water pump because of lack of electricity to drive one, write us now about our petrol engine-driven Speedwellette Water Pump. Once installed, you are assured of 240 gallons of running water per hour at 50lb. pressure. Ideal for operating our "Spring-Shower" Sprinkler (sprinkles 50ft. diameter). (Larger engine-driven pumps also available.)

BRIGGS & STRATTON ENGINE-DRIVEN

SPEEDWELLETTE WATER PUMPS

LET US SUPPLY FULLEST DETAILS.

Brown Bros. ENGINEERS LTD.

Pumping Machinery Specialists since 1908.
590 Colombo Street, P.O. Box 548J, Christchurch.

Annuals of many kinds can be sown in February in the cooler districts to winter as small plants and make a worthwhile display in spring.

Ashes accumulate rapidly in most households. Wood ashes are a valuable source of plant foods, especially potash, and where wood is the main fuel used for domestic heating the ashes should never be wasted. They should be stored in a dry place and applied to the soil whenever it is dug over; put day by day on some part of the garden not carrying a crop and allowed to wash into the soil; or, best of all, put on the compost heap each day. The lime in the ashes will benefit the compost and the plant foods ultimately will be returned to the soil when dressings of compost are put on the garden. If wood ashes are allowed to accumulate in some odd corner open to the weather, rain will dissolve and wash out most of the valuable ingredients, which will then be wasted. Buying of potash fertilisers should rarely be necessary in households using wood as the main fuel if the ashes are used in this way.

Coal ashes, on the other hand, should never be used in the garden. They contain practically no plant foods, but may contain a dangerous amount of boron—sufficient to cause damage to plants. Though boron is an essential plant food, it is required in only very small amounts, and regular dressings of coal ashes could build up the boron in the soil to a dangerous level. The dustbin is the best place for coal ashes.

Bowls of bulbs flowering in the house in spring always make a welcome addition to the display of pot plants and offer a reminder of the bulbs which will be flowering in the border a little later. Specially prepared bulb fibre, sold by seedsmen, should be used for bulbs in bowls without drainage holes, as soil goes sour under such conditions, but bulbs can be grown perfectly well in ordinary plant pots containing a potting soil, and lachenalias, freesias, and small bulbs in general will grow much better in soil than in fibre. After bulbs have been potted the containers should be stood, or sunk in soil to the rims, in the coolest, shadiest place available for about 6 weeks. They need watering from time to time and the soil must not be allowed to dry out. A good plan is to cover the pots with old sacks or with a few inches of sand or old fine cinders; this top layer helps to keep the pots cool and reduces drying out to a minimum, and the added weight prevents the bulbs from lifting themselves out of the soil as their roots grow. All the flowers in a bowl are rarely at their best at the same time; that can be overcome by planting all the bulbs about 3in. apart in boxes, growing them in the usual way, and then digging them out and potting them up into bowls when the flower buds are showing clearly, matching the plants chosen for each bowl. Rather surprisingly, the bulbs do not seem to resent being transplanted in this way while in full growth, but they should be dug out of the boxes as carefully and with as many roots as possible.

Bulbs for spring flowering as a rule should be planted as early as possible. Early planting does not necessarily mean earlier flowering, as the varieties flower in roughly the same order and at about the same dates each season, whether planted relatively early or late, but earliness of planting does affect the size and quality of the blooms, as the earlier-planted bulbs will develop larger root systems, better capable of producing large flowers and leaves, than will those planted later. A succession of flowers should be ensured by planting a range of varieties and not by planting one variety at intervals. Apart from the always-popular tulips, narcissi, hyacinths, freesias, and lachenalias (the last two will not stand very heavy frost), ixias and Dutch irises should be more widely planted to extend the bulb season into early summer. *Freesia burtoni*, a great improvement on the older types, has very fragrant, large flowers of beautiful form and texture; it cannot be raised true to name from seed.

Chrysanthemum Hon. Mrs. Helme Pott. The best-quality flowers cannot be obtained from chrysanthemums unless disbudding is carried out as described below.

Chrysanthemum disbudding is the removal of unwanted flower buds, usually the smaller ones, when they are not larger than about pea size, by pushing them gently sideways until they drop off. That operation results in larger flowers, as by removal of some of the buds a better supply of food is left for those that remain. On the other hand, heavy thinning of buds tends to shorten the total flowering period of any plant, as fewer flowers will remain to open after the first ones fade. Little disbudding need be done on chrysanthemums grown for garden display unless particularly fine individual blooms are wanted, when the central bud should be left. Some single varieties are best partly disbudded by having all but the top three or four buds on each stem removed, but many gardeners take the easy way and grow chrysanthemums as "sprays" (that is, with no flower buds removed), each stem bearing a succession of flowers, though they lack the size and substance of blooms from disbudded plants.

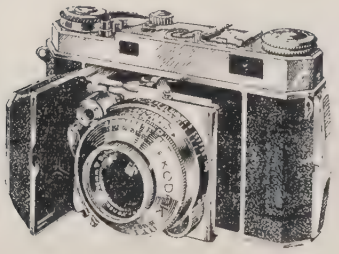
Cuttings of shrubs and many other plants put into a frame in January to root should be inspected regularly and sprayed with water daily to reduce wilting until the plants have developed roots of their own. Cuttings usually perk up and the leaves become fresh and crisp before the new roots grow, as the callus that forms over the end of a cutting can take in some water from the soil. The first sign that the cuttings have formed new roots is when fresh green leaves start to develop in the centres of the plants. When the cuttings have rooted, the frame light should be left off and the young plants allowed to grow naturally until they can be planted out, either into an odd corner of the garden to grow on or directly into their permanent places. The sooner they are planted out the better, but delaying until autumn is often wiser than planting in the drier summer weather when each plant may need watering several times to keep it alive. The old saying "Plant when it is wet and sow when it is dry" contains much truth.

Everlasting flowers, though not very fashionable now, can be useful for decorating the home in the off season, especially in hilly inland districts where borders are flowerless in winter and there is no local shop to provide out-of-season flowers. Statice, helichrysum, rhodanthe (helipterum), and acroclinium all have flowers with hard, scaly petals that retain their colours when dry. They can all be grown as annuals by sowing seed in boxes in spring, growing the plants in boxes in a frame, and then planting them out in October or November, or by sowing the seeds outdoors in spring. The flowers should be cut when about half open with the longest possible stems, tied in bunches, and hung upside down in a shed out of sunlight and dust. The plants are left in this position until the stems have dried and stiffened so that the flower heads will not droop when they are arranged in vases, in which no water should be used. As soon as the stems are dry and stiff the bunches should be stored in a cardboard box until required. Honesty can also be used as an everlasting flower, but the plant is left untouched until the seed pods have ripened, as the silver "moons" for which it is grown are the central parts of the ripe seed boxes. Even larkspur flowers can be used by cutting the stems when the flowers are fully developed and drying them as described; the petals shrivel somewhat, but retain much of their colour. Though everlasting flowers can be kept for years, it is best to grow a new lot each season and to throw away the old ones when the spring flowers come in, as they are usually full of dust by that time.

Gladioli may be ready to lift in February in the northern, warmer districts, but elsewhere are only at their prime. The best time to lift them is about 6 weeks after the flowers have faded, and the best methods are to spread the entire plants out in shallow boxes or trays until the foliage has completely died down, or to hang them up in bunches in a dry, airy shed. The stems and leaves should not be cut off until they have quite died down and returned to the corm all the food materials which they contained when lifted.

Hedges of evergreen species should be given their last clipping before winter. They should then be reclothed with short new shoots before growth ceases and will look neat and tidy throughout winter. The secret of keeping hedges of reasonable size and pleasing appearance is to trim them often but lightly, as heavy cutting makes them unsightly and may spoil coniferous hedges by leaving bare places which never grow again.

KODAK
Retina Cameras!

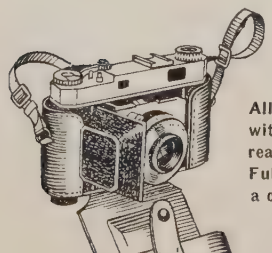


35 mm. Precision-Built Cameras

(1) Kodak Retinette: Schneider Reomar f4.5 50 mm. coated lens. Fully synchronised Prontor S. Shutter, speeds 1 sec. to 1/300. Flash contacts, £29/5/9.

(2) Kodak Retina 1a: f3.5 Xenar 50 mm. coated lens, £38/12/3. f2.8 Xenar 50 mm. coated lens £43/18/6. Synchro-Compur Rapid Shutter, speeds 1 sec. to 1/500. Flash contacts.

(3) Kodak Retina 11a: Coupled view and rangefinder, Xenon f2 50 mm. coated lens. Synchro-Compur Rapid Shutter, speeds 1 sec. to 1/500. Flash contacts, £81/14/9.



All Models with Ever-ready Case. Full range accessories available.

Write for Free Illustrated Literature.
See the Magnificent New Retina Cameras NOW—at all Chemists, Kodak Dealers and

KODAK NEW ZEALAND LTD.

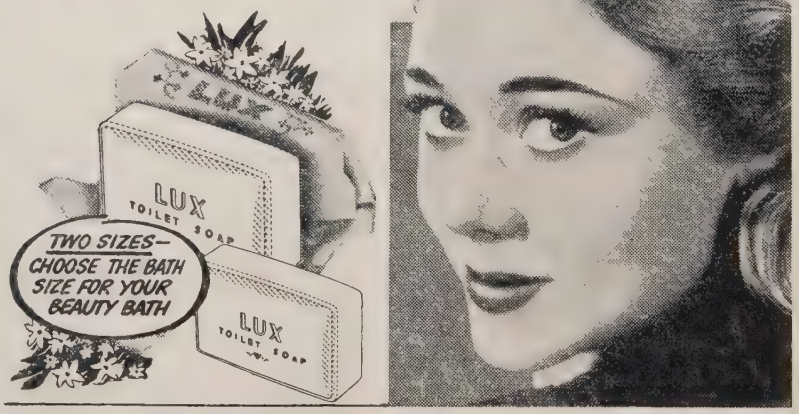
292 Lambton Quay Wellington. 162 Queen Street and 14 Fort Street, Auckland. 681 Colombo Street, Christchurch. 162 Princes Street, Dunedin.

It's thrilling the way **Lux Toilet Soap's** active-lather facials leave skin softer, smoother.

says lovely

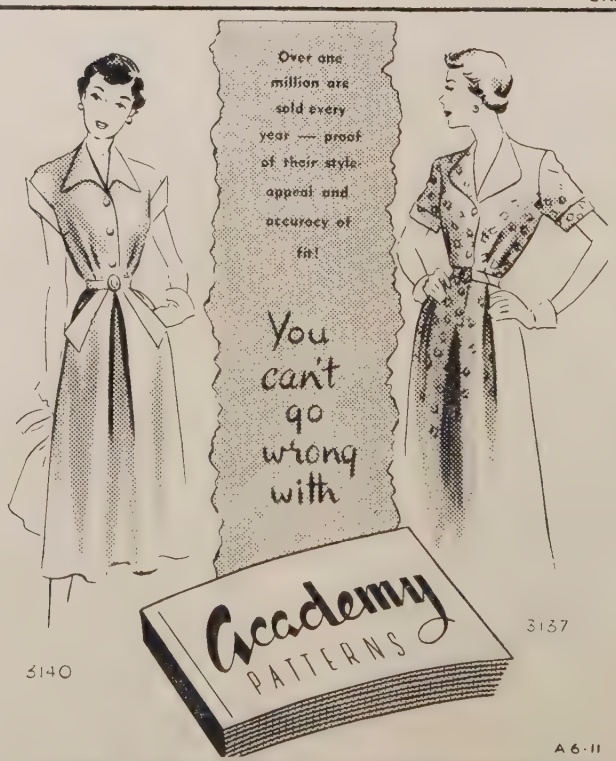
Glynis Johns

star of London Films



THE BATH AND COMPLEXION CARE OF 9 OUT OF EVERY 10 FILM STARS

LT.264.4½Z


Over one million are sold every year — proof of their style appeal and accuracy of fit!
You can't go wrong with
Academy PATTERNS
3140
3137

A 6-11

OBTAINABLE FROM LEADING STORES THROUGHOUT NEW ZEALAND

Right in fashion - Right in fit!

Hoeing is still necessary, even though there may be few weeds to kill after the hot, dry, summer weather—"good weed-killing weather", as the market gardeners call it. One danger at this time of year is that the surface may become baked and hard, in which case rain is likely to run off instead of soaking immediately into the soil, and the gardener cannot afford to waste any rain which may fall in late summer. Another danger is deep cracking in prolonged dry spells, causing accelerated drying out of the soil and much damage to root systems. Regular hoeing between the plants, especially a few hours after each rainfall, will do much to avoid both those undesirable conditions.

Loam, the main ingredient of all seed-sowing and potting composts, should be stacked and allowed to rot before being used. Gardeners who are going to raise their own seedlings and pot plants will need loam next spring, and a supply of turves should be obtained and stacked to rot. Early summer is the best time of year to dig turves for this purpose, as the soil and grass are still moist, but if the turves are dry when collected, they should be damped thoroughly as the stack is built.

Marguerites, especially the double white and the pink forms, are useful winter-flowering plants for all the milder districts, but are in disfavour because they soon look shabby if not properly attended to. In addition to regular removal of flower heads, either marguerites should be raised afresh each year from cuttings (which root very readily) or the bushes should be cut down hard in late summer to encourage new shoots to grow and flower through winter. Under this treatment marguerites are quite worthy of a place in the garden and will repay the attention given to them. They are also useful as cut flowers, but are much easier to arrange gracefully if cut with long stems from which most of the leaves are stripped.

Oxalis leaves will be reappearing in February as the bulbs start to grow after their short summer rest. The only hope of controlling this weed is to carry out a relentless war against it. A leaf must not be allowed to stay above ground longer than a day or two, and any bulbs seen when the ground is cultivated must be picked out and burnt. For gardeners unfortunate enough to suffer from this pest late summer is a good time to start an all-out campaign against it.

Pot marigolds (calendulas) sown in boxes in February, pricked out into other boxes when large enough to be handled, and later planted out in any vacant space in the flower borders or shrubberies will provide a brilliant display of colour from midwinter onward in all but the coldest districts. These winter-blooming marigolds seem to have larger blooms and more vivid colours than those grown in summer. Orange and yellow pot marigolds, purple hybrid wallflowers, daffodils, and jonquils, planted together in autumn in beds in a Wellington garden a few years ago, produced a display of colour through winter and spring that excited quite a lot of local attention.

Schizanthus (butterfly flower) is one of the best annuals for growing in pots in a glasshouse or sunporch. Seeds should be sown in February in a pot or box and the seedlings pricked out into small pots and then grown on to flower next spring.

The grass-grub (*Odontria zealandica*). From left—First, second, and third stages of the grub; the pupa or resting stage; and the adult beetle.

Self-sown seedlings of antirrhinums, pot marigolds, cinerarias, and many other plants can usually be found growing in beds at this time, especially under plants where the hoe has not disturbed the ground—and, however diligent the gardener may have been in picking off faded flower heads, it seems almost impossible not to miss occasional heads, which ripen and shed their seeds. Self-sown seedlings can be watered, then carefully lifted, pricked out into boxes, and grown on into good plants to be set out in autumn.

Other Tasks for February

Plant anemones and ranunculuses for early flowers.

Continue to **layer** border carnations and **take cuttings** of pinks and perpetual-flowering carnations.

Strike more cuttings of such plants as lavender, catmint, verbena, and geraniums if required.

Shake out, repot, and **start into growth** cyclamen corms that were dried off in early summer and rested.

Root a few cuttings of choice fuchsias in 3in. pots to make flowering plants for the windows next season.

Sow seeds of Iceland poppies in boxes kept in a shaded place until the seedlings show.

Caterpillars

In late summer caterpillars of all sorts are likely to be troublesome, often defoliating cinerarias and wreaking havoc with geraniums and many other flowering plants. It is characteristic of caterpillar attacks that they come in "epidemics". For months relatively few caterpillars may be seen, and then the gardener may quite suddenly find hundreds, which often do much damage before steps are taken to control them.

Every gardener should train himself to notice tiny holes in the leaves of plants, as these usually tell him that a new generation of caterpillars has just been hatched. An immediate application of derris or D.D.T. dust with a hand duster or of an arsenical spray should check the attack and prevent disfiguring damage. For flowering plants lead arsenate is best used at the rate of 1½oz. in 4 gallons of water. It is sometimes recommended that twice the quantity of hydrated lime be added to reduce the risk of the lead arsenate causing leaf scorch, especially when it is applied to young and tender foliage, but hydrated lime is not always easy to obtain in the small quantities the home gardener needs.

Lead arsenate does not dissolve in water and remains in proper suspension for only a short time. When it is being drawn from a bucket with a garden syringe the liquid must be kept well stirred. As the chemical is a stomach poison, it must be applied systematically over the plants to make sure that all the foliage is covered. If the application is uneven, much unsightly damage can be done by the caterpillars before they eat enough of the lead arsenate to kill them—in fact, some even seem to be able to eat round the poisoned patches.

Grass-grubs

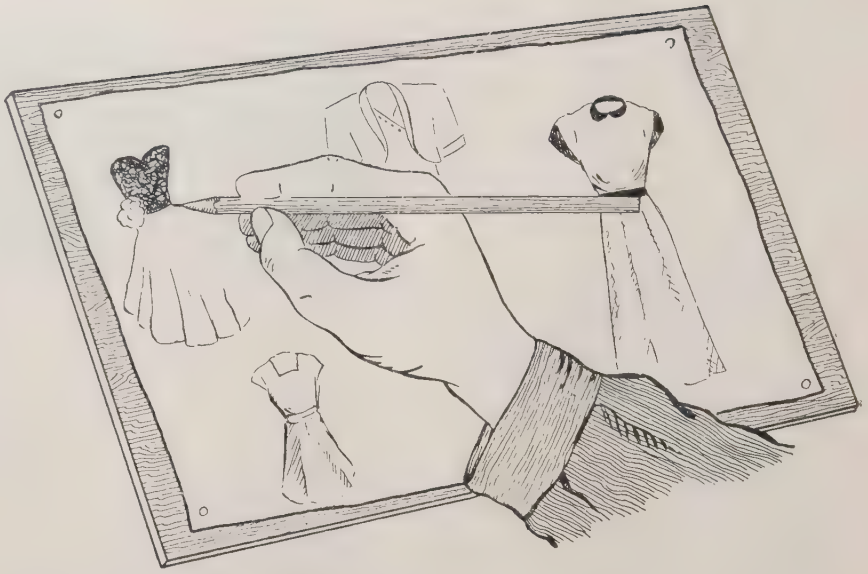
The larvae of a brown beetle that flies at night in early summer, grass-grubs, which are cream coloured with brown heads, can be recognised from all other soil creatures by the fact that they are always seen lying curled in a half circle. They are voracious feeders, eating the roots of grass and many other plants, including small fruits and flowers. Though grass-grubs damage the roots of flowering plants seriously, they rarely kill them and often the poor growth of the flowers is attributed not to grass-grub attack but to some other cause. Consequently no steps are usually taken to eradicate grass-grubs from the flower borders.

The most obvious damage caused by grass-grubs is to lawns, where they may cause large areas of grass to die out in late summer. Nothing can be done to save the lawn at this stage, as the grass is already dead and all that remains is to sow more, but lawns can be safeguarded ("proofed") against grass-grub attack by dressing them with lead arsenate. This is most effective if used at the rate of ¾oz. to the square yard, mixed with twice the volume of sand, evenly spread, and watered in thoroughly. The lawn should also be rolled to press damaged grass plants back into contact with the soil and help them to reroot. Proofing, which should be done in early summer, is usually very effective, reducing damage to negligible proportions, as most of the young grubs are poisoned by the lead arsenate. The greatest care should be taken when using lead arsenate, as it is intensely poisonous to human beings.

When a new lawn is being laid down it is always worth while to incorporate 1½oz. of lead arsenate to the square yard with the top inch of soil before sowing the seed to proof the lawn against grass-grub attack for 4 or 5 years, after which the dressing recommended should be applied each year.

All photographs except that of grass-grubs by Douglas Elliott.

The Place of Wool in the Fashion World



IF one material has endeared itself to the hearts of dress designers more than any other today, it is wool, for it is one fabric which can change its character for the occasion. In the right hands it can equal the elegance of cloth of gold, provide a chic if sober background for massed jewellery, or, in the shape of a perfectly tailored suit, take a woman anywhere at any time.

BECAUSE its fundamental qualities made it a material which the world could not do without, all the obvious ways of using wool had long since been explored when the great modern dress designers glimpsed its hidden possibilities. Discovering, among other things, that it made a perfect background for the magnificence of "jewelled" embroidery, they began deliberately to work in opposition to all the accepted theories that it could be used only for practical purposes, and introduced a new type of garment into fashion—the informal-formal evening gown.

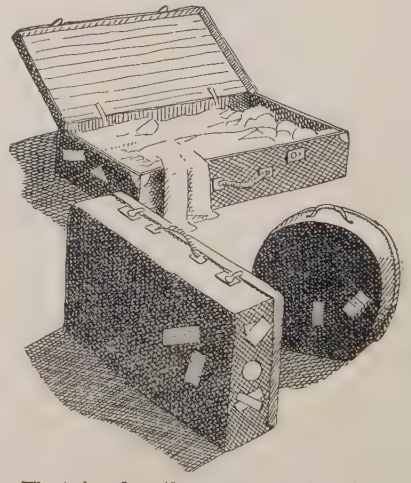
Manufacturers were quick to react, and the result is seen in the soft flexibility and versatility of modern woollens, which have had a greater influence on women's clothes than probably any other material in the history of dress. In the collections today fine woollens of every type lead the way, and the effects on the new fashions are interesting.

It is certain that, having exhausted the first exuberance, this particular trend showing a rounded, more feminine line has come to stay, and it is from this that the next phase of fashion will develop. However, unlike the stiff, whaleboned styles of the 19th century to which some of the new fashions seem to hark back and which made popular a certain sculptured elegance, contemporary life demands that modern clothes have an air of mobility.

Modern Trends in Fashion

Hence, even in the classic suits, the woollens used —tweeds, worsteds, suitings, and flannels—are light and soft, so that when slight artificial touches are added, such as padding to accentuate the hip curve, the modern feeling is not lost. This applies also to the afternoon suits for which woollens of dress weight are used in order that the rounded lines may be accentuated more easily by means of skilfully arranged draperies and fullness, and to the dinner gowns into which horsehair stiffening is introduced to spread the material widely over the hips.

All this slight artificiality is intended to impart an air of leisured importance which is a reaction to the semi-masculine styles of the years of war and is the basis of the feminine line being shown in all the new collections. Because this effect is purely superficial—for women have no intention of turning their backs on their problems—it follows that the designers are choosing woollen materials of all kinds to express their ideas, since these alone look luxurious yet basically fulfil the needs of the ordinary woman.



That is also the reason why, in addition to all its other uses, a new career is opening for wool. In one important collection three weights of woollen material were introduced in a single ensemble, all in the same weave and the same colour—a heavy weight for the topcoat, a medium for the jacket, and a light weight for the frock. In an air-minded world the capsule wardrobe, planned for a quick journey from the chill of a northern climate to the heat of the Antipodes, is making its bow. Each item must be planned to travel and pack and travel again, taking up the minimum of space and never losing its crisp freshness.

Finishing Necklines and Collars of Garments

THE neckline is an important part of a woman's garment, as it frames the face and neck of the wearer. In this article Edith G. McNab, Rural Sociologist, Department of Agriculture, Dunedin, describes some methods of finishing necklines.

WHETHER a neckline is finished by a binding, facing, or collar, construction details should not detract from the appearance of the garment. Binding is used most for collarless dresses made of sheer fabrics. Necklines of washing frocks and tailored garments are usually finished with a facing or with both facing and collar.

Fitted or Shaped Facing

A fitted facing may be applied on the inside or outside of a garment. On the outside it usually serves as a decoration, and it may be of a contrasting colour, it may have a piping round it, or the edge may be stitched to simulate a tuck. If a facing is not decorative and does not form revers, it should be put on so that none of it is visible from the right side of the garment. For a garment of thick fabric the facings may be of silk in a matching colour to reduce the bulk.

Fig. 1 shows how to derive a pattern for a shaped facing. The pattern shown has a front opening from the neck to the waist. For a garment without an opening to the waist the facing would not be carried so far down the front.

As a wide shaped facing stays in place better than a narrow one, the facing is made 2 to 2½in. wide. For the back facing the width is the same all the way round, measuring from the neck outward. For the front facing the same width is marked off from the neckline along the shoulder-seam line. As the garment has a front opening, and the upper part may be turned back, the facing must be wide enough to provide for finishing the rever. The bottom of the facing is 2 to 2½in. wide plus the lap for the closing.

The back and front facings are joined by a plain seam at the shoulder. After the seams have been pressed open, the facing is pinned and basted to the garment, right sides together, shoulder seams, centre backs, and any notches marked on the pattern being matched exactly. The seam is machine stitched. The seam allowance is trimmed to an even, narrow width and clipped almost to the stitching at intervals round the inside curve of the neck and at the bottom point from which the rever is turned back. The seam allowance at the point of the rever is cut off. This clipping ensures that the seam allowances will lie flat when the facings are turned to the wrong side. Fig. 2 shows the facing stitched to the garment, the seam allowances clipped, and part of the facing turned to the wrong side. This turning to the wrong side should be done carefully so that the seam is not obvious from either side.

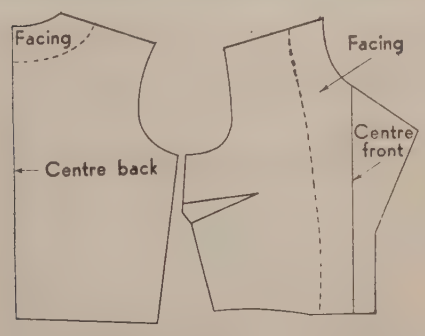


Fig. 1—The dotted lines mark off the portions of the patterns which would be used for fitted facings.

Fig. 2—The facing stitched to the garment and part of it turned to the wrong side. The seam allowance has been cut off at the point of the rever and clipped round the neckline, the free edge of the facing has been turned and stitched, and lines of basting stitches mark the centre backs.

In the illustration the edge of the facing is left free and finished by the making of a narrow turning and machine stitching close to the folded edge. Other edge finishes are overcasting and pinking. The edge of the facing can be turned under and slipstitched invisibly to the garment; this is desirable for washing frocks, as it simplifies ironing after laundering.

Bias Facing

As the finished width should not be more than ½in., bias strips up to 1½in. wide are used for facings, this width allowing for a ½in. seam and a ½in. turning. If a strip long enough to go round the neck cannot be obtained, join shorter strips on the straight and press the seams open before using the bias.

Baste the bias to the neckline, right sides together. Stretch the edge of the bias slightly on outside curves and ease it slightly on inside curves. If the pattern has ½in. seam allowances, sew ½in. from the edge and trim to about ¼in. afterward. Turn the bias facing to the wrong side so that none of it shows on the right side of the garment. Turn in the raw edge and blindstitch or slipstitch it to the garment.

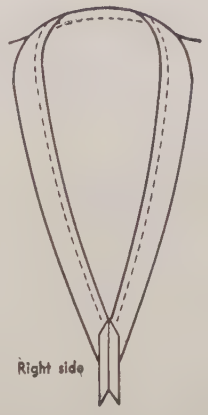
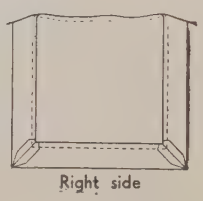


Fig. 3—A diagonal seam at the point of a V neckline fits the bias facing to the garment. The projecting seam allowances at the lower end of the seam will be clipped off and the facing then turned to the wrong side and finished.

Fig. 4—Bias facing strips can be joined to form square corners, or one strip can be used and tapering tucks made from the neckline corners outward to make the bias lie flat.



Figs. 3 and 4 show how to use the bias at the point of a V neckline and at the corners of a square neckline. Instead of seams at the corners of a square neck, tapering tucks can be taken from the inside corners to the outside edges of the facing. The tucks are clipped and pressed open. Clip the garment seam allowances at the corners before turning the facing to the other side.

Neck Openings

If the neckline fits closely round the base of the throat, an opening must be provided for ease of putting on and taking off the garment. This opening must be neatly and securely finished, with stitches and fastenings as inconspicuous as possible unless they are to be part of the decoration. It may be at the back or front of the garment or may be made in the shoulder seam. If the opening is in the shoulder seam, a neat bound and faced placket may be made; this was described in an article about dress plackets in the "Journal" for March 1951.

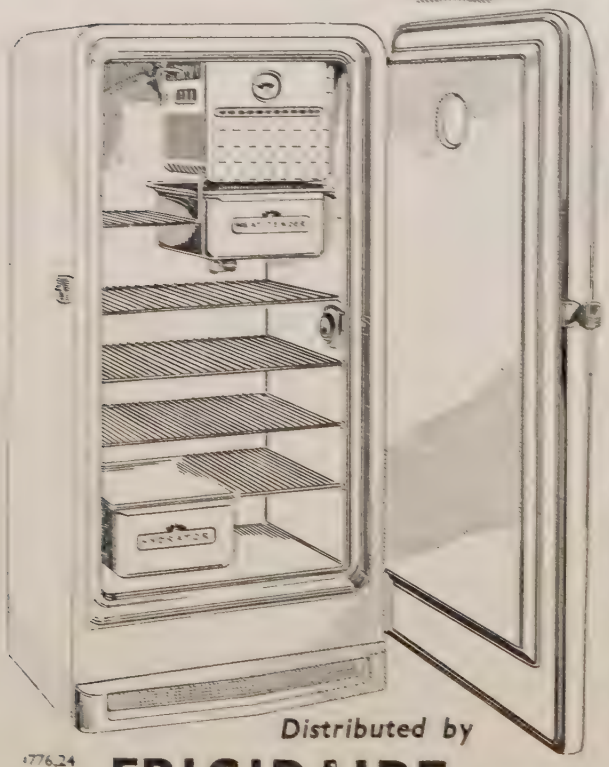
Sometimes a front opening is part of the design of the dress, but when there is no seam up the centre front or back of a bodice it may be necessary to cut a little way down the centre front or back to provide an opening. Such a slash may be finished by binding or facing or insertion of a slide fastener. If an underlap is desired, a continuous bound and faced placket may be used; this was also described in the article about plackets.

you get MORE

Plus Features

in the 7·4 cu.ft

Frigidaire



More Refrigerated Storage Space—less size! Compare this handsome 7.4 cu. ft. FRIGIDAIRE with all other makes of refrigerator. Check its overall size—then look inside at the usable **refrigerated** storage space it provides.

WORLD-FAMOUS "METER-MISER" Only FRIGIDAIRE has the exclusive sealed unit "Meter-Miser"—simplest cold-making mechanism ever made. Uses less current than an ordinary light bulb and is guaranteed for 5 years.

LARGE SUPER FREEZER—Stores 19.2 lbs. of packaged ice cream and other frozen foods at freezing temperature. Spring-loaded door stays open or shut as required.

MEAT STORAGE COMPARTMENT—Separate compartment—"Meat Tender" keeps meat in perfect condition for long periods, and separate from other foods.

VEGETABLE STORAGE—in the roomy Hydrator. Glass-topped. Keeps salads and vegetables crisp, fresh and full of vitamins—ready to serve.

"QUICKUBE" ICE TRAYS—The famous FRIGIDAIRE "Quickube" Ice Trays come out easily no matter how hard they are frozen. Ice-cubes pop up at the pull of a lever—two at a time or a tray-full!

AUTOMATIC INTERIOR LIGHT—goes on when you open the door, off when you close it. Lights the whole storage compartment brightly.

ADJUSTABLE COLD CONTROL—A turn of the switch will ensure a faster freezing rate when ices or ice-cubes are required quickly. Twelve different settings are available, including "off" and "Defrosting". Special setting for holiday periods.

Distributed by

FRIGIDAIRE DIVISION OF GENERAL MOTORS NEW ZEALAND LIMITED

THROUGH A NEW ZEALAND-WIDE NETWORK
OF AUTHORISED FRIGIDAIRE DEALERS

1776.24

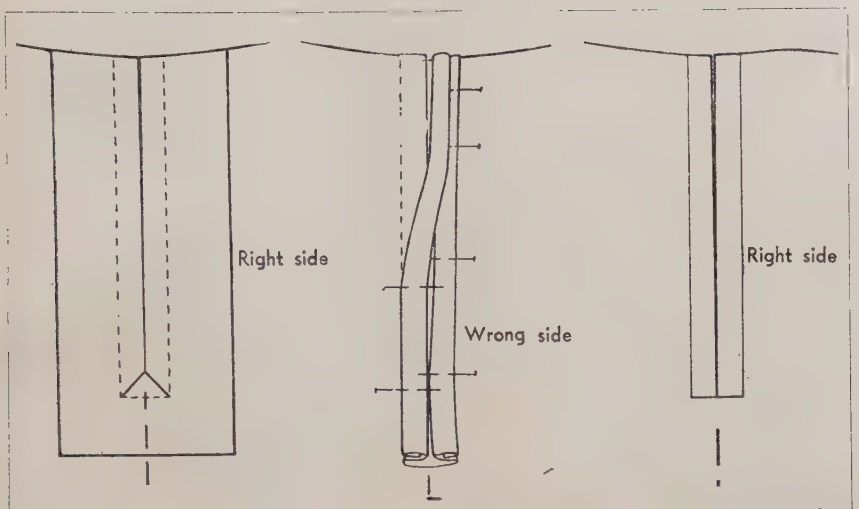


Fig. 5—A straight bound slash. Left: A straight strip has been stitched to the garment, with centre lines (marked by lines of basting) coinciding. The square corners at the bottom of the slash have been clipped diagonally. Middle: The binding has been brought through to the wrong side with the seam pressed toward the centre. The edges of the binding are turned in and the binding folded in halves, the turned edge being brought just to the machine stitching. A pleat has been made in the binding at the foot of the slash. Right: The completed slash.

Straight Bound Slash

A strip 2in. wide and 1in. longer than the desired length of the placket is cut on the straight of the fabric. The strip is basted with its centre lengthwise line directly over the centre back or front of the garment, extending from the neckline downward, with right sides together. Starting at the neck edge, the strip is machine stitched to the garment, with a seam not more than ¼in. wide, down one side of the centre line for the required distance and up the other, square corners being made at the bottom of the placket.

The slash is made on the centre line to within ¼in. of the bottom. Cut diagonally into the corners of the stitching at the bottom of the slash, taking care not to cut the stitching. Turn the binding to the wrong side, pressing the seam toward the centre back. Turn in the raw edge of the binding and fold it in halves, making a pleat in the free end of the binding at the bottom of the slash. Bring the turned edge just to the line of machine stitching, pin it, and baste it. Make sure that the two widths of binding are the same on the right side of the garment.

Finish the binding by hand stitching its turned edge to the garment, taking each hand stitch under a machine stitch.

Bias Bound Slash

Baste a strip of bias binding 1in. wide down the marked line for the slash, right sides together, rounding the end and continuing up the other side back to the neckline. Stretch the bias as the end is rounded. Machine stitch the binding in place and cut on the marked line, stopping ¼in. short of the end and making two or three diagonal clips almost to the rounded section of the stitching at the end. Turn the binding to the wrong side, fold under the raw edge, and hand stitch as described for the straight binding.

The finished binding should not be more than ¼in. wide and the rounded end should be neat and unwrinkled. A beginner will find trimming off some of the width of the binding after making the first seam easier than working with a very narrow strip.

Faced Slash

A faced slash is frequently used in the front of a garment for a convertible neckline, with the opening worn either closed or open with the edges turned back. A collar is often worn with this type of front opening.

A facing is cut about 2in. wide at the shoulder seam and with the neck edge the same shape as the neckline of the garment. The width of the facing depends on the style of the garment, and the length should be at least 1in. greater than the length of the desired opening. The grain should be straight at the centre front.

Fig. 6—A faced slash. The facing has been stitched to the garment, centre lines coinciding, with tapering stitching. The slash is cut almost to the stitching at the bottom.

The position of the slash is marked on both the facing and the garment. The two are basted with right sides together so that the marked lines coincide. Machine stitch up to ¼in. from the marked line, gradually narrowing to a point at the end of the line. When turning the material to stitch up the second side, leave the needle in the fabric to pivot round when the presser foot is raised. Cut down the marked line almost to the point of the stitching. Turn the facing to the wrong side, and baste and press it so that none of it is visible from the right side. The edge of the facing may be finished by any of the methods mentioned under the heading "Fitted or Shaped Facing".

The manner in which the neck edge is finished depends on whether or not a collar is to be attached. If no collar is used, a shaped or bias facing should be cut for the back of the garment, its shoulder seams joined to the front facing, and pressed open. After the slash has been stitched down and up, the stitching may be continued round the neckline. Finish the work as described for a shaped facing.

Slide Fasteners

A secure fastening, quick to open and close, can be made with a slide fastener. The fastener should be obtained before the opening in the garment is made. Fasteners suitable for neck openings and for skirt plackets have a metal band across the bottom of the fastener only; those best for under-arm dress plackets have bars across top and bottom. Use of a slide fastener on very lightweight materials is inadvisable. A slide fastener is most successful when used on fabric which is as heavy as the tape of the fastener. Sometimes lightweight fasteners can be bought.

Exposed Slide Fastening

This technique may be used for slide fasteners at the wrists of sleeves as well as for neck openings. If the fabric is firmly woven and will not fray, merely cut on a line marking the position of the opening, stopping a little way from the end of the mark and making two diagonal clips similar to those shown in the illustration for the straight bound slash (Fig. 5). The length of the slash should equal that of the fastener plus the seam allowance at the raw neck edge. Fig. 7 shows the slash with the edges turned back and basted ready for insertion of the fastener. A triangular turning is made at the end of the slash. The width of the turnings should be such that the opening just exposes the metal or plastic part of the fastener.

The fastener is basted in position, right side of fastener to wrong side of garment, with the turned edge of the slash coming just to the outer edge of the metal part of the fastener, which should not extend into the seam allowance at the neck. The fastener is stitched in by machine with a cording foot, working with the right side uppermost and stitching about 1/16in. from the edge of the fold, making the width from the fold even and uniform. Be sure enough room is left for the slide to move up and down.

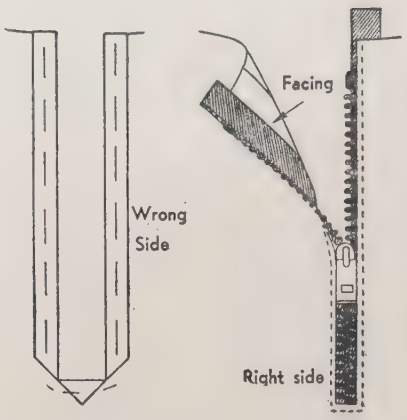


Fig. 7—An opening finished with an exposed slide fastener. Left: A slash with the edges turned back ready for insertion of the fastener. The triangular turning at the bottom has been formed by the diagonal cuts at the end of the slash. Right: The slide fastener stitched into a faced slash.

If the fabric tends to fray, face it with a 2in.-wide strip cut on the straight instead of turning back the edges. Make the seam allowance half the width of the metal part of the fastener and turn square corners at the bottom, making a straight line of stitching across the end of the slash. This stage will appear as in Fig. 5. Turn the facing to the wrong side, basting and pressing so that it is all out of sight from the right side. It should lie perfectly flat, with square bottom corners. Insert the fastener and finish the work as already described. Do not cut off the ends of the fastener tapes, but fold them back. Finish the neck edge with a facing.

Concealed Slide Fastening

Mark the position of the opening on the garment. Prepare two facing strips 1in. wide and 1in. longer than the opening is to be, preferably with one edge a selvedge. Baste and machine stitch the strips to the garment, placing the raw edges against the marked line and right sides together. Make ⅜in. seams. Do not stitch across the end of the opening, but cut the threads at the end and make a separate seam on the other side. Make the stitching exactly the length of the fastener plus the seam allowance at the neck. Cut on the marked line. Turn the facings to the wrong side.

Fold the opening right sides together, with facing edges and seam lines coinciding. From the end of the facing seams sew a small tuck, tapering to the edge of the fold ⅛ to ¾in. below the end of the marked line as in Fig. 8. When pressed this tuck will be barely noticeable from the right side, and it serves to bring the ends of the opening together. Baste and press the facings, leaving none visible from the right side.

Baste the fastener to the faced opening, ensuring that the faced edges meet at the centre of the metal; they can even have a slight overlap. With the cording foot on the machine, and with the right side of the garment uppermost, stitch the fastener to the opening, keeping an even distance from the edge. Do not make the stitching further from the edge than necessary, but allow enough room for the slide to operate freely; the width will depend on the type of fastener.

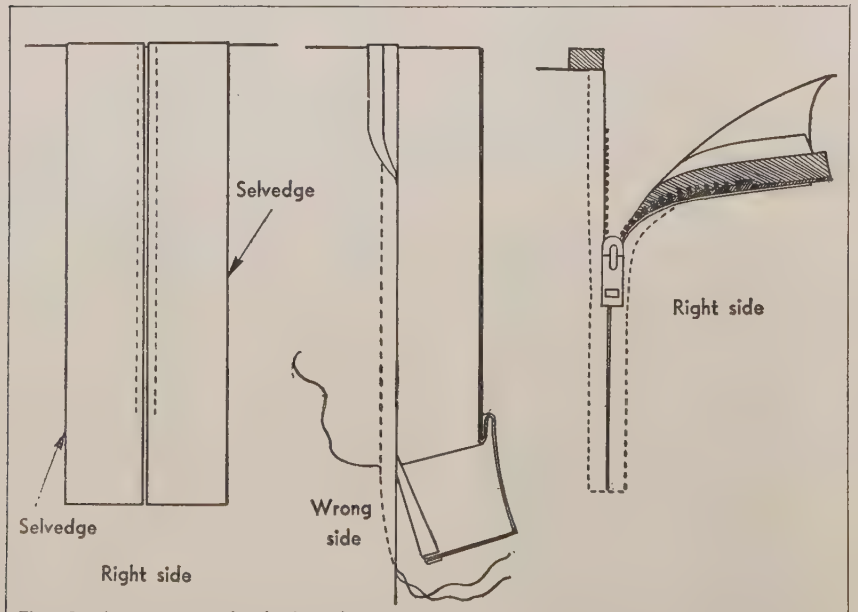


Fig. 8—An opening finished with a concealed slide fastener. Left: The facings sewn on. Middle: The facings are brought to the wrong side and the garment is folded, with seams coinciding. A tuck has been stitched, starting from the end of the facing seam and tapering to the edge of the fold. Right: The fastener stitched into the faced opening. The tuck has brought the edges of the opening together at the bottom. The faced edges meet over the centre of the fastener.

Collars

Usually a collar is made double and, except for a coat, the under collar is usually cut with the grain running in the same direction as the upper collar. Collars for dresses are often made before they are attached to the garments, though the procedure is different for tailored collars.

Seams joining upper and under collars should usually be trimmed to ¼in. wide. Before the collars are turned to the right side after being joined, seam allowances must be clipped or notched so that they will lie flat and corners must be cut off so that the points of the collars are not spoiled by bulkiness and bluntness. After the collar has been joined to the neck it is usually necessary to clip the seam allowance of the neck (the cut edge being a circle of smaller circumference than the seam line) and to notch the neck edge of the collar at any part where that edge curves outward (the cut edge being a circle of greater circumference than the seam line). Correct treatment of the seam allowances contributes much to comfort and fit.

The quickest way of attaching a collar is to have it turned to the right side, place it on the right side of the garment neckline with the under collar next to the garment, then place the facing on top wrong side uppermost and right side next to the collar. Collar and facing can then be stitched on in one operation, but this method has the disadvantage that it results in four seam allowances which must be turned the same way, so the join is bulky, especially if the garment is of thick material. This way is best used for lightweight fabrics or for single collars. One of the following methods or an adaptation will be satisfactory in other circumstances.

Convertible Collar

This may be combined with a faced slash opening. The facing for the opening extends to the shoulder seam and is joined to the shoulder seam of the back facing, which may be fitted or bias. These shoulder seams in the facings are pressed open. The ends of the collar are stitched and the collar is turned to the right side.

The seams at the ends of the collar and joining the facing to the front opening are pressed open. Pin the neck edge of the under collar to the garment, right sides together, and pin the edge of the upper collar to the facing, also right sides together, matching the end seams of the collar exactly with the seams of the front opening, and matching centre backs and any notches marked on the pattern.

Ease the collar to the neck edges; it is advisable to begin pinning from the centre back (once the points mentioned have been matched) to one front, then work from the centre back in the other direction. When the collar has been basted to the neck edge of the garment on one side and the neck edge of the facings on the other side, a continuous seam can be stitched round it. Use small basting stitches, and machine stitch over the basting to ensure good control of the fabric. Always machine stitch with the garment uppermost and the eased collar underneath next to the feed dog. Trim the seam allowances if necessary, and cut off the corners of any seams which have been

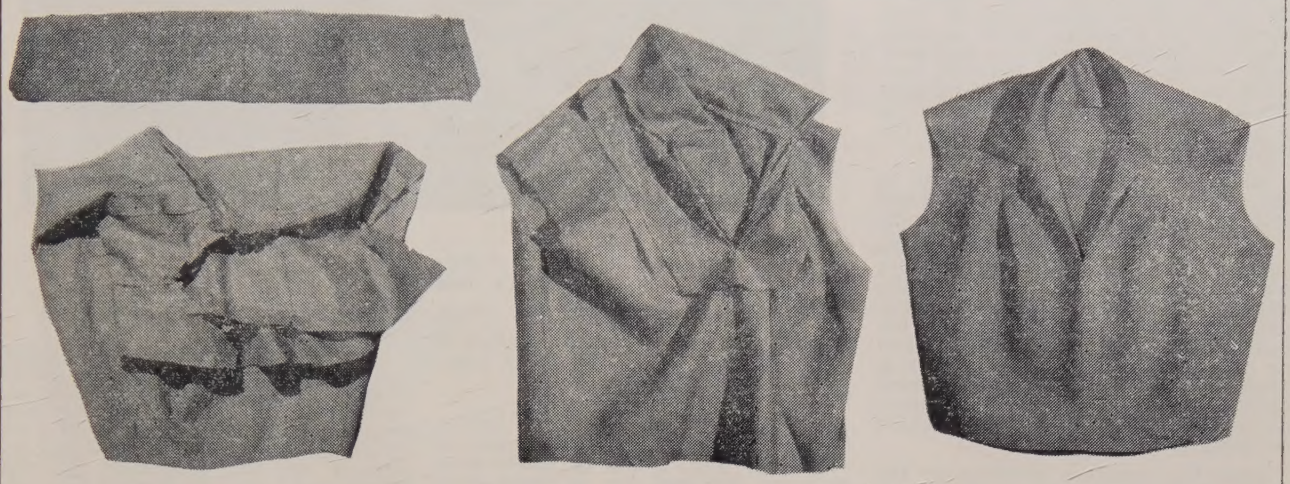


Fig. 9—A convertible collar. Upper left: The collar ready to be turned to the right side and attached to the neck edge. The corners of the seams have been clipped and the centre back has been marked with a line of basting. Lower left: The collar partly pinned to the facing and neck edge. The centre backs match, the seam joining the facing to the garment at the front slash is pressed open, as is the seam across the end of the collar, and the collar is eased to the neck edge. Middle: The collar joined to the garment and facings and ready to be turned to the right side. The seam allowances on the neck edges of the garment and facings have been clipped, and the seams across the ends of the collar and those joining the facing to the garment at the front opening have been pressed open. Right: The finished collar.

crossed by the previous one. Clip or notch the seam and press it open.

Turn the facing back on to the wrong side of the garment and finish its edge as desired. If the edge of the facing is left free, the shoulder seams may be caught with a few stitches through the shoulder seams of the garment; this helps to keep the facing in place.

Notched Tailored Collar

For tailored-style collars on overalls or dresses notched tailored collars may be used. For coats the method is the same, but with the addition of an interlining and stitching on the under collar. Usually a dress which is in a tailored style has a front opening, often to the waist, so fitted facings are required from the shoulder to the waist in front and for an even width of 2 to 2½in. round the back of the neck. The collar pieces are not stitched together before being joined to the garment.

First the shoulder seams of the facings are stitched and pressed. Join the upper section of the collar to the neck edge of the facings, holding right sides together and matching the centre backs and any notches marked on the pattern. The ends of the collar will not reach to the front edges of the facings, as the front of the garment and the facings will allow for an overlap and underlap for the front closing. The end of the collar may come just to the centre front line; if that is so, start and stop the machine stitching on the centre front mark. Do not carry it across the seam allowance at

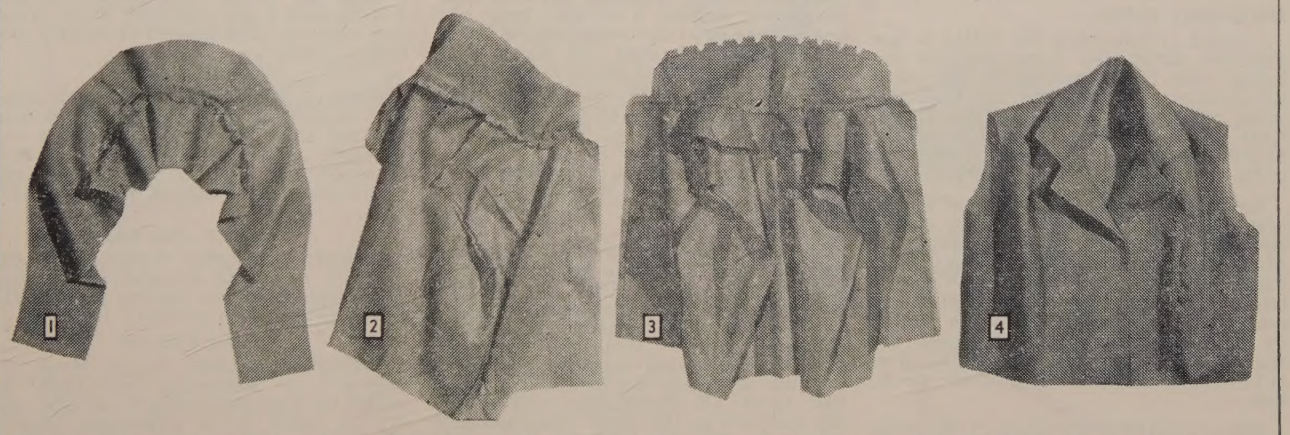


Fig. 10—A tailored collar. 1: The upper section of the collar joined to the neck edge of the facings. The seam allowance of the neck edge has been clipped and that of the collar notched so that the seam can be pressed open. The machine stitching ends at the centre front ½in. short of the end of the collar and the threads are tied. Both seam allowances are clipped to the end of the stitching. 2: The under collar joined to the garment. Centre backs match, and the end of the seam line on the collar meets the centre front line. 3: The facing and upper collar sewn to the garment. Corners have been cut off and seam allowances clipped ready for the collar to be turned right side out. 4: The finished collar.

the ends of the collar. Pull the threads through to one side and knot them. Clip both seam allowances almost to the end of the stitching. Clip the seam allowance at intervals round the neck edge of the facing and, as the neck edge of the collar will have an outward curve, cut notches out of its seam allowance. Press the seam open. If a back facing is not used, join the upper collar to the front facings.

Similarly, join the under collar to the neck edge of the garment, right sides together, and press its seam open.

Place the facings and upper collar against the garment, right sides together, matching the ends of the stitching round the neck edge exactly, and also matching centre backs of the collar pieces and any notches marked on the pattern. Pin them, starting from the centre back, and baste them carefully to hold the pieces in their correct positions until the machine stitching is done.

Start the machine stitching at the waist of one side, sew up the facing, turn the corner at the top of the facing, and stitch along until the needle is in the spot where the stitching of the neck edge ended. Raise the presser foot, pivot the fabric round the needle, ensure that the corners of the seam allowances are out of the way, lower the presser foot, and sew the ends of the collar pieces together. Turn the corner and continue sewing round the collar and down the front of the garment until the waist is reached.

Trim off the corners of the seam allowances and clip or notch them where required so that they will lie flat. Turn the facings and collar right side out and press them. Finish the raw edges of the facing as desired. The shoulder seams of the facing should coincide with the shoulder seams of the garment, and the two seams at the neck should coincide. Catch the seams together by hand if required.

This method of attaching a collar gives a good "set" and makes for greater comfort and less bulky seams where the collar is joined.

Detachable Collar

Instead of attaching the collar to the garment, finish the neck edge of the collar with bias binding. If ½in. seam allowances are used, cut the bias 2in. wide, so that the finished width is ½in. Ease the bias slightly to the collar. Finish the neck edge of the garment with either a bias or a fitted facing.

Sew several halves of domes to the bias binding on the collar on the under side. At least five will be required, placed at each end of the collar, about each shoulder seam, and at the centre back. They may be required at intermediate places also. Pin the collar to the garment, mark the positions for the other halves of the domes, and stitch them on the facing of the neckline.

When a collar is attached in this way only a moment is required to remove it for laundering and to replace it afterward. Two detachable collars for one dress may be useful.

All photographs by Campbell Photography.

[*Sparrow Industrial Pictures Ltd. photo.*

CHOU PASTRY, the type usually used for cream puffs and chocolate eclairs, is easy to make and can be used in a variety of ways in the making of either sweet or savoury dishes.

TO make the basic recipe boil 3oz. of butter with a cup of water in a saucepan and add 5oz. of sifted flour all at once. Beat the mixture over heat until it leaves the side of the saucepan. Allow it to cool for 5 minutes and add 4 unbeaten eggs one by one, beating each in until the mixture shines.

Drop the mixture in spoonfuls on a cold greased tray and bake it in a hot oven (400 degrees F.) for 10 minutes. Lower the temperature and bake the puffs for a further 30 minutes or until they are free from beads of moisture. If a wood or coal range is being used, it may be necessary to put a sheet of paper over the puffs to lower the temperature.

Recipes

Cream Puffs

Use the basic recipe and form each puff with a dessertspoon of mixture. Fill the cooked puffs with whipped cream and dust them with icing sugar.

Eclairs

Use the basic recipe. Shape the mixture on a cold greased tray with a biscuit forcer or a pastry bag and tube. Make the eclairs 3 to 4in. long and bake them as in the basic recipe. When the eclairs are cold ice them with chocolate or coffee icing, split them, and fill them with whipped cream, custard filling, or caramel filling.

Custard Filling

1 egg
1 cup of milk
1 teaspoon of cornflour
1 dessertspoon of sugar
A few drops of vanilla

Heat the milk. Separate the egg and beat the yolk and the sugar together until they are thick and lemon coloured. Mix the sugar, cornflour, and vanilla to a smooth paste with 1 tablespoon of water. Pour the hot milk into the cornflour mixture and then this mixture into the beaten egg yolk. Stir them all thoroughly and return the mixture to the heat. As soon as it starts to thicken fold in the stiffly beaten egg white and cook the filling for 2 minutes.

Caramel Filling

¾ cup of sugar
1 tablespoon of butter
1¼ cups of milk
5 tablespoons of cornflour

Melt the butter and sugar together and cook the mixture until it is golden brown. Add 1 cup of boiling milk and stir rapidly to prevent lumps from forming. Mix the cornflour with ¼ cup of cold milk, pour a little of the hot mixture into this thickening, and stir. Then add the thickening to the remainder of the hot mixture and boil it until it thickens. Allow the filling to cool slightly before using it.

Frozen Puffs

Prepare the puffs from the basic recipe, slice off their tops, and fill them with ice cream. Put each top on the side of the ice cream and sprinkle chopped nuts over the exposed ice cream or garnish it with chopped jelly. Serve the puffs with jam sauce as a dessert.

Jam sauce: Boil 1 cup of jam (strawberry, raspberry, or plum is suitable) in ¼ cup of water for 2 or 3 minutes. Thicken it with a little cornflour if necessary.

Chocolate Chou Rings

Prepare the basic recipe, shape the pastry in rings or circles on a cold greased tray, and bake them. Split the rings, fill them with chocolate butter filling, and sift icing sugar over the top.

Chocolate butter filling: Melt 2oz. of butter, add 2 tablespoons of cocoa, stir them together, and cook them for 1 to 2 minutes. Allow the mixture to cool a little, add ¾ cup of sifted icing sugar, and beat the filling until it is light and fluffy.

Savoury Puffs

Prepare pastry from the basic recipe and bake it in teaspoonfuls on a cold greased tray. Fill the puffs with any savoury filling. Creamed lobster, creamed fish, creamed chicken, cheese, asparagus, and creamed corn are suitable.

Savoury Pop-ups

Prepare the basic recipe, drop the mixture into cold greased patty pans, and bake it as for cream puffs. Fill the pop-ups with savoury fillings.

Queen Fritters

Prepare the basic recipe, drop the mixture by spoonfuls into deep fat which is just beginning to smoke, and fry it until it is delicately brown. Drain the fritters well and fill them with either sieved fruit pulp or a savoury mixture.

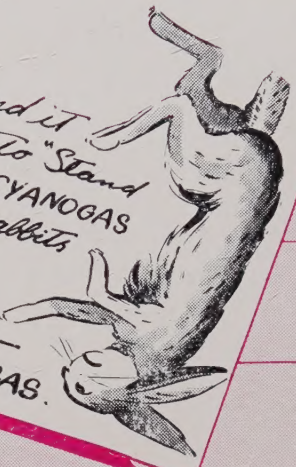
—*NELL MACPHERSON, Rural Sociologist,*
Department of Agriculture, Auckland

Printed by Blundell Bros. Ltd. (The Evening Post), Wellington—32295

leaves from a farmer's diary

Great stuff this CLEANSO - nothing like it for really speedy drenching. It's so economical and positive too — must make a note to get another supply when I'm in Town. CLEANSO PTZ DRENCH

Never found it so easy before to "Stand them on their heads" CYANOGAS is the job to clean out rabbits and other farm pests completely. Bill was asking about rabbit control — must tell him about CYANOGAS.



Must watch old Billy's lameness and treat him with RADIOL - great stuff

Mustn't forget to order some ROCKGAS in advance. It's really short supply because it's so popular for cooking & lighting.

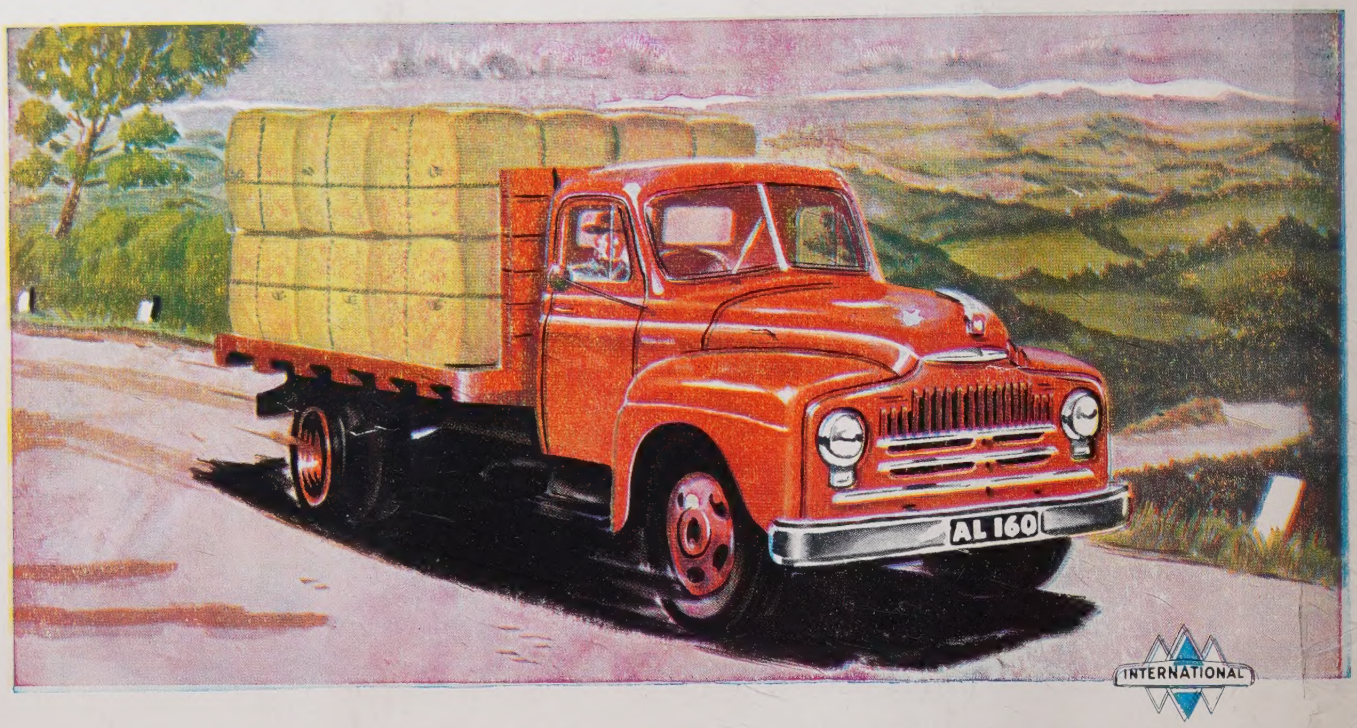
Time for a cup of SOUTHERN CROSS tea and bed - Glad the wife got one of those 5lb chests of SOUTHERN CROSS

ESTABLISHED 1861

CHALLENGE

Wright, Stephenson & Co. Limited

Branches throughout New Zealand



Tough transport jobs need INTERNATIONALS!

Every model *Heavy-Duty Engineered* to save you money

● Whether the trip is hauling timber from bush to railhead, or multi stop city delivery, it is all the same to an International Truck. Every model in the complete International line has extra stamina built into every part. That's Heavy-Duty Engineering —for real savings in truck operation and maintenance!

No matter what size truck you use, International offers a model specialized for the job, with the right valve-in-head engine, frame and transmission. There's correct springing for load and road . . . a roomy cab with full visibility.

From the smallest pickup to giant six-wheelers, each International stands for sound engineering and full truck value. Get the facts from your nearest International Harvester Branch or Dealer. The International Harvester Co. of N.Z. Ltd., P.O. Box 563, Christchurch.

Better living through Better Roads.

ALL NEW—ALL PROVED

- **NEW** Functional Styling
- **NEW** Outdoor Visibility
- **NEW** "Comfo-Vision" Cab
- **NEW** Super-Manoeuvrablity
- **NEW** Engine Accessibility
- **NEW** Valve-in-head Triple Diamond Engines
- **NEW** Specialized Transmissions
- **NEW** Rear Axles
- **NEW** Brake Systems
- **NEW** Steel-flex Frames
- **NEW** Load-balanced Wheel-bases
- **NEW** Cradle-Action Springs

INTERNATIONAL HARVESTER

International Harvester Company of New Zealand Limited
Auckland, Palmerston North, Wellington, Christchurch (Head Office), Dunedin.